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'*Knowledge is proud that he has learned so much,*
Wisdom is humble that he knows no more.'—COWPER.

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Pestalozzi.

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CHAPTER V.

THE METHODS OF PESTALOZZI.

The teaching of Pestalozzi may be considered a new point of departure in the history of education, but from the very fact that modern elementary education has been so completely Pestalozzianized we are apt to forget how much it owes to Pestalozzi. His principles have, in the main, met with such universal acceptance that they seem to be almost self evident, and to have come to us, as it were by the light of nature. We are inclined to ask, Who that had turned his attention to the subject, could fail to see that education in order to be successful must begin with the first dawn of intelligence, must follow the natural order of the development of the faculties, must start from the point at which the child is standing, and advance outward in concentric circles, to embrace wider and wider fields of knowledge? Yet it cost Pestalozzi the unremunerated labour of fifty anxious years, and the sacrifice of all that makes life dear, to bring home these and a few more equally elementary truths to the intelligence of mankind.

Are we then to suppose that no one ever thought of these 'principles' before Pestalozzi first promulgated and exemplified them? The wise man has told us that 'there is nothing new under the sun,' and it is true that most of the constituent parts of Pestalozzi's system are to be found scattered up and down like broken lights in the earlier history of education. His work consisted mainly in concentrating them into one focus. Thus Pestalozzi's fundamental principle, that the mother is the first and best of educators, and the home the first and best of schools, had been a leading feature in Roman education 2,000 years before. Luther, in the sixteenth century, and Comenius, the famous Moravian bishop, in the seventeenth, had taught that education should begin 'with the mother's school in every home.' Comenius again had anticipated Pestalozzi in enunciating the truth that education should follow the order and course of nature; and be so contrived as to take advantage of the fact that man has an innate tendency to improve the faculties with which he has been endowed. Again, the famous Jesuit teachers of the Renaissance anticipated Pestalozzi in seeing that a primary condition of success in education is to gain the confidence and attachment of the scholar, so as to be able, from thoroughly understanding his nature and character, to apply the guidance, encouragement, or restraint, best suited to the wants of the individual. From the example of the Jansenists of the two short-lived Port Royal Schools, Pestalozzi might have borrowed another leading feature of his system, namely, to discard emulation as an incentive to studious exertion, and to endeavour to supply its place by making the pupil find delight in the sense of his own accumulating knowledge and his own progress and growth in intellectual power.

Contrast between Pestalozzi's principles and his practice.

I use the expression 'might have borrowed' advisedly, for Pestalozzi apparently knew little, and cared less, for the previous history of educational experiments. It was one of the most unfortunate and fatal weaknesses of his position that he had early learned from his master, Rousseau, to 'hate and despise books,' and to recognise no merit or value in the exertions and the experiences of the great teachers who had preceded him. In what then does the importance and originality of his work consist? Chiefly in this, that having made out for himself a few leading principles which he believed to be true (and which turned out to *be* true in the main),—he set himself to the task of promulgating them with such dogged perseverance, such intensity of conviction, and such entire self-devotedness, that he compelled the world to listen to him at last. It was to this, 'the divine faculty of taking pains,' which, according to the Germans, is the true definition of genius,—that Pestalozzi owed his success as a practical teacher; for it must be confessed that there was hardly one of his own principles of education which he strictly carried out in the actual methods and conduct of his schools. In fact, he pathetically laments on more than one occasion the discrepancy between the beauty and truth of his principles and the imperfections of his practice. He was a poor unlearned man who had undertaken to grapple with some of the

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profoundest problems which have exercised the ingenuity of mankind; and though his insight was clear, and his objects sufficiently defined, he constantly felt the inadequateness of his practical powers to carry out his magnificent ideals. By way of illustrating the inconsistencies which appear in Pestalozzi's system when fact comes face to face with theory, it may be mentioned that while he justly regards the mother's instincts as the best guide to the treatment of the infant mind when it first begins to observe and inquire, he finds himself encountered by the difficulty that not one mother in ten is capable of the task of developing the perceptions of her child. He is compelled, therefore, to fall back upon 'Compendiums of Knowledge' to be put into the mother's hands—compendiums, which he asserts will 'enable the mother of the most limited capacity to instruct just as well as the most talented. The mothers have only to keep strictly to these books in the instruction of their children.' These compendiums brought down some not unnatural, and perhaps not altogether undeserved, ridicule upon their author's head. As an example of the method of teaching 'Language'—'the mother's spelling book,' says he, 'must contain the entire range of sounds of which the language consists, and portions of it should be repeated daily in every family, not only by the child who is going through the exercises in order to learn how to spell, but also by mothers, within hearing of the child in the cradle; in order that these sounds may by frequent repetition be so deeply impressed upon the memory of the child, even while it is yet unable to pronounce a single one of them, that they may never be forgotten. No one imagines to what a degree the attention of infants is aroused by the repetition of such simple sounds as ba, ba, ba, da, da, da, ma, ma, ma, la, la, la, or what a charm such repetition has for them.' On this passage, one of Pestalozzi's biographers remarks, 'if the rocking songs sung to the babe in the cradle are to consist of such bleatings as these, it is enough to frighten away its guardian angels.'

Again he constantly enlarges, and justly, on the mischief arising from mere word-knowledge in education, as opposed to the knowledge derived from perception and experience. 'In our lower school establishments,' he says, 'the mind is loaded with a burden of empty words which has not only effaced the impressions of nature, but has even destroyed the inward susceptibility to such impressions.' But in the book for mothers, and indeed elsewhere, occur passages which seem to show that Pestalozzi attributed something little short of a magical power to words. The lessons prescribed by him are found to consist not even in the naming of objects, so much as in the acquisition of names, for their own sake. For example:—'Lessons in nature consist in giving the children lists of the names of the most important objects in all three kingdoms of nature, etc. The lists of words are placed in the hands of the child merely as exercises in learning to read; and I have found that it is possible to make the children so thoroughly acquainted with these lists of words that they shall be able to repeat them from memory in the time that is required to perfect them in reading.' As an example of a less objectionable but still quaint and roundabout method of 'teaching language through observation,' the following passage is quoted from the experiences of Ramsauer, who has been already mentioned as a pupil of Pestalozzi. 'The hangings (in the castle of Burgdorf) were very old and torn, and in front of these we had frequently to stand for two or three hours together, and say what we noticed in respect of the form, number, position, and colour of the figures painted on them, and the holes torn in them, and to express what we observed, in sentences gradually increasing in length. On such occasions he would say, "Boys, what do you see? (He never named the girls.) *Answer:* "A hole in the wainscot." *Pestalozzi:* "Now repeat after me:—I see a hole in the wainscot—I see a long hole in the wainscot—through the hole I see the wall—through the long narrow hole I see the wall. I see figures on the paper-hangings—I see black figures on the paper hangings—I see round black figures on the paper-hangings—I see a square yellow figure on the paper-hangings—and so on."'

And this curious illustration of his practical subordination of observation and association to names and mechanical detail, is to be found in the method which he actually employed in teaching geography. He proceeds thus:—'One of the sub-divisions of Europe is Germany. The child is first of all made acquainted with the divisions of Germany into ten circles, then the names of the towns of Germany are placed before him, at first in mere alphabetical order for him to read, but each of these towns is previously marked with the number of the circle in which it lies. As soon as the child can read the names of the towns fluently he is taught the connection of the numbers with the subdivision of the main-heads, etc., etc.' In all this, be it observed, there is no hint of the use of a map.*

But not to weary the reader with further details, it may be said that Pestalozzi has, as it were, set his own seal and signature to the indictment which experience has brought against his *methods*, in recording the following incident. M. Glayre, a member of the Executive Council of Bern, on hearing an explanation of his system, came out with the ominous remark, 'You want to make education mechanical.' 'He hit the nail on the head,' says Pestalozzi, 'and supplied me with the very expression that indicated the object of my endeavours, and the means which I employed for attaining it.' It must be borne in mind that Pestalozzi was a self-taught man, and all the blunders which occasionally deface his system were those of a self-taught man. It has been well said of him that 'he wanted the historical basis.' Methods which had been discovered long before, tried and found wanting, appeared to him as new revelations made to himself, and he had to learn their inefficiency by bitter

* It is only fair to state here *in Pestalozzi's own words the* method of teaching geography *which he believed to be the right* one, and which has now been, in its general outlines, adopted by most intelligent teachers:—

'The instruction in this subject begins with the observation of the district in which we live, as a type of what the surface of the earth presents. It is then separated into elementary instruction (*a*) including physical, mathematical, and political geography, and (*b*) the typographical part in which each of the departments of the subject, suggested by the observation of the surrounding district, is prosecuted in a graduated course, and then reciprocal bearings brought out. By this foundation the pupils are prepared for forming a clear and comprehensive view of the earth and man, of their mutual influences, of the condition of states and peoples. The children are made acquainted with the statistical portion of the subject, that is, the natural productions, numbers of population, forms of government, etc.—by means of tabular views.'

personal experience—and at his pupils' cost. Everything had to be 'evolved,' like the well-known German camel, 'out of his own consciousness,' and he exhausted himself in inventing expedients which either were worthless when brought to a practical test or had been invented and brought to perfection long before, if he had only known of them.

These inconsistencies have been dwelt on thus far, and at some length, partly because they seemed necessary elements in a true portraiture of Pestalozzi, and partly to account for the fact that many of his *Methods* have been consigned to a not wholly unmerited oblivion, while his *Principles* have exerted an ever-growing influence on popular education—stronger, perhaps, at the present time than when he was their living exponent, and at the zenith of his reputation. His principles are immutable, his methods were experimental; and many of them, though condemned by himself on trial, have been unfortunately perpetuated by injudicious disciples, to the disadvantage of elementary education and the detriment of Pestalozzi's fame.

Of these methods, however, some few which contained a richer and more fruitful germ, have developed into a world-wide utility. Among these may be mentioned the plan of simultaneous syllabic reading—of mutual instruction—of teaching form and number by concrete examples, which forms the basis on which Fröbel built up his famous superstructure of the Kindergarten—and lastly, the introduction of object lessons, which now enter largely into the programme of every good infant school. Of these, the first two were almost forced upon him by the circumstances of his position. (1) Of simultaneous reading Pestalozzi says, 'The confusion arising from a number of children repeating at once, after me (their sole teacher at Stanz), led me to see the necessity of a measured pace in reading and speaking, and this measured pace heightened the effect of the lesson.' (2) It was at Stanz also that he first hit upon the expedient, afterwards so largely adopted by Bell and Lancaster, of setting children to teach children. But Pestalozzi's plan was very different from what was known in England as the 'Monitorial System,' by which 'one child was drilled through an artificial machinery of lifeless tasks, and the child so drilled employed, for pay, to drill others in the same manner and by the same means.' 'Seeing that I had no assistant teacher,' says Pestalozzi, 'I placed a child of superior capacity between two others. He threw his arms round their necks; he taught them all they knew; they learnt from him what they knew not; they sat by the side of each other with heartfelt affection; joy and love animated their souls; the life which was awakened in them, and which had taken hold of their minds, carried both teacher and learners forward with a rapidity and cheerfulness which this process of mutual enlivening alone could produce.'

Pestalozzi was in the habit of dividing the elements of knowledge into three branches—Language, Form, and Number. It is hardly necessary to point out that these three categories do not embrace the whole field of knowledge in its most elementary aspect. There are numberless phenomena which present themselves to the observation of a child which have nothing to do with language, form, or number,—but for practical purposes Pestalozzi tells us he found this classification work well.

(To be continued.)

How a Scotch School was Examined.

INFANT SCHOOL.

On coming into the room the Inspector asked for the schedule and cancelled the absentees, and then heard the whole sing from the modulator, pointing the syllables himself. The intervals were rather difficult—

d r m s d' d' r m l f r, &c.

One *action* song was asked, and out of a list of twenty object lessons he chose that on a 'Chair' to be given by the teacher.

Reading.—Every one read—the highest class professing Collins's Infant Reader.

Writing.—The whole of the alphabet—both capital and small letters were asked and carefully examined.

Arithmetic.—Mental arithmetic in addition and subtraction of numbers up to 16 was given by the teacher.

JUNIOR DEPARTMENT.

STANDARD I.

Professed two sets of Readers—Blackie's Graded and Nelson's Star Reader. It was a large class occupying five forms, with fifteen on each form. One form read, another wrote a line, while a third worked the following sums, which were given out in words:—

(1) Add 319, 790, 909, 51, 815. 2,884. Ans.

(2) Add 987, 789, 867, 759, 949. 4,351. Ans.

(3) From 900 take 29. 871. Ans.

The rest of the class was not examined.

STANDARD II.

Showed writing copies, and was examined like Standard I., being asked for nouns, and also tried with verbs and adjectives. Dictation was taken from their own set of reading books. 'Often the hunters approach quite near to a tiger before they see it, as the striped skin of the animal is so like the colour of the forest grass.'

Arithmetic.—These sums were read out in words:—

1. 2,005 + 5,010 + 20 + 3,010 + 990 + 9,060. 20,095. Ans.

2. From 2,090 take 19. 2,071. Ans.

The following were given out in figures:—

3. From 12,986,530 take (beginning below the 9) 897,019. 12,089,511. Ans.

4. Multiply 975,607 by 6. 5,853,642. Ans.

The scholars were placed back to back.

The intelligence of the class was tested with closed books in batches of six.

SENIOR DEPARTMENT.

Music and Singing.—After a modulator exercise introducing **ta** and **fe**, as **d' ta l s fe s**, the children were tested with moderately difficult ear exercises, such as **l f r**; **d r m**; **m f s**; **d m s f r d**, sung by the teacher to the syllable la.

Singing test.—Key D.

| d :m | s :d' | l :f | r :d | s_1 :l_1 | t_1 :d ||

Time test.—

| l :— |— :— | : | l.l : l.l | l : | l :— ||

Questions were asked regarding number of pulses and beating of time. Two songs were sung after the girls and boys had sol-fa'd their parts separately from the book.

STANDARD III.

Read a lesson from one set; closed books; read a lesson from second set; closed books and read again from first set, and so on alternately till the whole had read.

Intelligence was carefully tested, and the recitation afforded ample field for meaning of phrases and single words, not a line being omitted.

Dictation (read out by a pupil teacher):

'All over Scotland there are thousands of sheep and lambs that graze on the hills and plains, and in the lovely valleys. Are they put there merely to be looked at? No; they are there for use. They yield not only a great amount of food, but also large supplies of wool, which is made into clothing.'

Grammar.—Taken (1) on black-board—a subject and predicate being written, and the scholars asked to complete the sentence with an object if necessary, subjects and predicates being similarly required. (2) Sentences were given on slates, to be analysed in writing. (3) Parts of speech were asked as a voluntary exercise.

Arithmetic.—Cards were given out. Example:—

1. Multiply nine hundred and seventy-five thousand eight hundred and sixty by eight thousand and ninety. 7,894,707,400. Ans.

2. Divide three hundred and ten thousand and sixty-eight by eighty-one (factors). 3,828. Ans.

3. Divide 7,345,678 by 871. $8,433\frac{535}{871}$. Ans.

4. Take £309 10s. 4¾d. from £1,000. £690 9s. 7¼d. Ans.

Geography.—Physical features of Scotland. As many different names for Capes as possible—definitions and illustrative examples.

History.—A pupil teacher questioned on the 'Life of Bruce,' and the Inspector took the chief incidents in the reign of Mary.

STANDARD IV.

Read out of one set of books and were tested for intelligence with closed books.

Analysis was tested on black-board and on slates. Construction of sentences introducing adjective and adverbial phrases was asked, and every word was parsed as it came in the sentence.

Dictation.—'Often when the mocking-bird is watching by the nest in which his mate is sitting, a rustling is heard among the leaves at the foot of the tree. Then two bright eyes glisten through the foliage; and presently a shining body begins to wreathe itself round and round the trunk, and slowly to ascend. It is the black snake, who has scented the eggs of the mocking-bird, and is determined to make a feast of them.'

Arithmetic:

1. Divide £81,068 0s. 7d. by 273. £296 19s. $0\frac{1}{2}\frac{106}{273}$d. Ans.

2. How many seconds are there in the month of January? 2,678,400 secs. Ans.

3. Reduce two hundred and nineteen square miles to poles. 22,425,600 poles. Ans.

4. How many threepences are there in seven thousand and ninety-nine pounds nineteen shillings and ninepence? 567,999 threepences. Ans.

Geography was tested by questions on the physical features of Ireland, and its chief towns.

History.—A searching examination was made respecting the events leading up to the Revolution; the Revolution and its results.

Repetition taken as in Standard III.

STANDARD V.

Reading from one set of books. One sentence, if well read, was sufficient for a pass.

Composition.—The title of the story was 'Finding out a Thief.'

Parsing and Analysis were tested from the reading lesson. No one was questioned on the construction of sentences.

Arithmetic:

1. Find by practice the value of 356 cwts. at £2 17s. 9d. per cwt. £1027 19s. Ans.

2. Make out the following bill:—

83 yds. at 3s. 9½d. each.
39 lbs. at 2s. 4½d. each.
90 pencils at 6d. per dozen.

(£15 14s. 8½d. ÷ £4 12s. 7½d. + 3s. 9d.) = £20 11s. 1d. Ans.

3. How many tons can I purchase for £29 3s. 4d. at 7d. per cwt.? 50 tons. Ans.

4. $\frac{5}{6}$ of $\frac{24}{35} \div 3\frac{9}{7}$. $\frac{1}{10}$. Ans.

Geography.—A drew a map of France, B a map of Australia, C a map of Spain, and put in mountains and rivers. They were examined orally on Australia and the rivers and mountains of Europe.

History.—American War of Independence; causes of the war; leaders; events; decisive victories. The French Revolution was tested in the same way, particular reference being made to the career of Lord Nelson.

Repetition was rigidly tested, as well as the meaning of the whole piece professed, no word or phrase of any consequence being passed over.

STANDARD VI.

Reading from one set of books — Star Reader No. VI. 'An Ancient Roman Holiday,' 'Moses at the Fair,' and 'Paper.'

Parsing and Analysis were taken from paragraph 2, 'Paper,' page 84, and questions were asked as to what constituted complex and compound sentences.

Essay.—A was to write a 'Description of a Walk in the Country.' B the 'Biography of a Horse or of a Dog.' C 'Description of a Menagerie.'

Arithmetic:

1. A cistern containing 1,500 gallons can be emptied by three pipes in 24 hours. In what time would another cistern containing 500 gallons be emptied by six pipes? 4 hrs. Ans.

2. If I own $\frac{4}{15}$ of a house and sell $\frac{5}{8}$ of my share for £450, what is the value of the whole? £2,700. Ans.

3. Add $2\frac{5}{8}$ of 2s. to ·4375 of 16s., and express the result as the decimal of 10s. 1·225. Ans.

4. Find the simple interest on £235 for 292 days at $2\frac{1}{2}$ per cent. £4 14s. Ans.

History.—Questions on the various Reform Bills, Education Acts, Russian War of 1854—55, and the History of the Indian Mutiny.

Geography of India, the physical features requiring a thorough acquaintance with the map. Historical associations of the country. No. 1 drew India; No. 2 Africa; No. 3 Cape Colony.

Repetition.—'Parting of Marmion and Douglas,' and some lines from the 'Prisoner of Chillon;' meaning and allusions were strictly tested, but little or nothing was asked about the formation of words.

The sewing was taken a Standard lower, and every item as given in Schedule 3 was asked. Specimens were vigorously tested as to firmness and capability of withstanding tear and wear. The Inspector for example pushed his finger through the button hole, stretched the stockings, pulled the patch, and strained the darn.

The pupil teachers were examined in teaching: one took an object lesson on the 'Sheep,' and another examined Standard I. on Arithmetic.

The class and general registers were tested by names taken at hap-hazard from examination schedules.

The general results of the examination were known before the Inspectors left, as the teachers were allowed to help in examining the Arithmetic and Dictation.

—o—

The Glass of Water; or, Cause and Effect.

(Comedy in Five Acts.)

LE VERRE D'EAU; OU, LES EFFETS ET LES CAUSES.

(Comédie en Cinq Actes.)

Scène III.	Scene III.
Les mêmes, Abigaïl.	The same with Abigail.
Abigail.	
Monsieur de Saint-Jean!	Monsieur de St. Jean!
[*Elle se retourne vers Masham à qui elle tend la main.*	[*She turns to Masham to whom she holds out her hand.*
Bolingbroke.	
Lui-même, ma chère enfant;	The same, my dear child;
et il faut que vous soyez née sous une heureuse étoile!...	and you must have been born under a lucky star!...
la première fois que vous venez à la cour,	the very first time you come to the Court,
y trouver deux amis!...	to find two friends there!...
rencontre bien rare en ce pays!...	a meeting very rare in this country!...
Abigail.	
[*gaîment.*	[*gaily.*
Oui, vous avez raison, j'ai du bonheur!...surtout aujourd'hui...	Yes, you are right, I have some good luck!... especially to-day...
Masham.	
Vous voilà donc décidée à vous présenter chez la duchesse de Northumberland?	You have then made up your mind to present yourself before the Duchess of Northumberland?
Abigail.	
Vous ne savez pas! j'ai appris que la place était donnée...	You do not know! I have heard that the place was given away...
Masham.	
Et vous êtes si joyeuse?	And yet you are so happy?
Abigail.	
C'est que j'en ai une autre!... plus agréable, je crois... et que je dois...	Because I have another!... a more pleasant one, I think... and which I owe...
Masham.	
A qui donc?	To whom?
Abigail.	
Au hasard.	To chance.
Bolingbroke.	
Cela vaut mieux!... c'est le plus commode et le moins exigeant des protecteurs.	That's better!... It (chance) is the most obliging and the least exacting of protectors.
Abigail.	
Imaginez-vous que parmi les belles dames qui fréquentaient les magasins de monsieur Tomwood, il y en avait une fort aimable, fort gracieuse, qui s'adressait toujours à moi, pour acheter...or, en achetant des diamants... on cause...	Just fancy that among the beautiful ladies who frequented Mr. Tomwood's shop, there was one very amiable, very gracious, who always came to me, when she bought anything ...now, when purchasing diamonds ...people chat...
Bolingbroke.	
Et Miss Abigail cause très-bien...	And Miss Abigail speaks very nicely...
Abigail.	
Il me semblait que cette dame n'était pas très-heureuse dans son ménage... qu'elle était esclave dans son intérieur, car elle me répétait souvent avec un soupir... Ah! ma petite Abigaïl, que vous êtes heureuse ici, vous faites ce que vous voulez... Si on peut dire cela... moi qui, enchaînée à ce comptoir, ne pouvais le quitter... et ne voyais monsieur Masham	It seemed to me that this lady was not very happy in her married life... that she was a slave in her private life (in her home), for she often said to me with a sigh... Ah! my little Abigail, how happy you are here, you do just what you please... How can anyone say such a thing... I who, tied to a counter, cannot leave it... nor see Mr. Masham but

que le dimanche après la messe,
quand il n'était pas de service à la cour...
Enfin un jour...il y a près d'un mois,
la belle dame eut la fantaisie d'une toute petite bonbonnière en or,
d'un travail exquis...presque rien...
trente guinées ?... Mais elle avait oublié sa bourse...
et je dis :
On enverra ce bijou à l'hôtel de milady...
Mais milady, que cela semblait embarrasser,
hésitait à nommer son hôtel,
sans doute à cause de son mari...
à qui elle ne voulait pas dire...
il y a de grandes dames
qui ne disent pas à leur mari...
et je m'écriai : Gardez, gardez, milady,
je prends tout sur moi.
Vous daignez donc être ma caution ?
répondit-elle avec un sourire charmant...
C'est bien, je reviendrai !...
—Mais pas du tout,
c'est qu'elle ne revint pas...

on Sundays after mass,
when he is not on duty at the Court...
At last one day...about a month ago,
the handsome lady took a fancy
to a very tiny gold lozenge box,
of exquisite workmanship... a trifle...
thirty guineas...but she had forgotten her purse...
and I said :
This box shall be sent to my lady's mansion...
But my lady, whom that (offer) seemed to embarrass,
hesitated to name her abode,
no doubt on account of her husband...
to whom she did not wish to speak of it...
there are great ladies
who do not like to tell everything to their husbands
and I said : Take it, take it, my lady,
I will be responsible for it.
You are willing really to be my security ?
she exclaimed with a bewitching smile...
Very well, you will see me again soon !...
—But not at all,
she did not return...

Bolingbroke.

[*riant.*

La grande dame était une friponne.

[*laughing.*

The great lady was a swindler.

Abigail.

J'en eus bien peur...
car un mois s'était écoulé...
Monsieur Tomwood était bien mal dans ses affaires,
et les trente guinées dont j'avais répondu,
je les devais à lui...
ou à ses créanciers...
C'était là ce qui me désolait,
ce dont, pour rien au monde, je n'aurais osé parler à personne...
mais j'étais décidée à vendre
tout ce que je possédais...
mes plus belles robes, même celle-ci,
qui me va bien, à ce qu'on dit.

I was very much afraid she was,
for a month had slipped away...
and Mr. Tomwood was in very bad circumstances.
The 30 guineas for which I was responsible
must be paid either to him...
or to his creditors...
That was what troubled me,
and I dared not speak of it to anyone...
but had resolved to sell
all I possessed...
my finest dresses, even this one,
which suits me so well, people say.

Bolingbroke.

Très-bien.

Very well indeed.

Masham.

Et qui vous rend encore plus jolie,
si c'est possible.

And which makes you still more beautiful,
if possible.

Abigail.

Voilà pourquoi j'avais tant de peine
à me decider...Enfin j'étais résolue...

That is why it was so difficult for me
to decide ... At last I had decided...

lorsque hier au soir
une voiture s'arrête à la porte,
une dame en descend, c'était milady...
'Bien des affaires trop longues
à m'expliquer l'avaient retenue...
et puis elle ne pouvait sortir
de chez elle à sa volonté...
et elle tenait cependant
à venir elle-même s'acquitter'...
Tout en parlant elle avait remarqué
que j'avais encore des larmes dans les yeux,
quoique je me fusse hâtée
de les essuyer à son arrivée.
Il fallut bien alors lui raconter
et ma détresse, et ma position,
et l'embarras où je me trouvais...
elle avait tant de bonté...
et moi tant de chagrin !
Enfin je lui parlai de tout,
excepté de monsieur Masham...
et quand elle sut que je voulais,
ce matin, me présenter chez la duchesse de Northumberland...
c'est elle qui me dit :
N'y allez pas,
vous seriez trop malheureuse...
d'ailleurs la place est donnée...
Mais moi, mon enfant,
je tiens dans le monde et à la cour
une maison assez considérable...
où, par malheur,
je ne suis pas toujours la maîtresse...
n'importe, je vous y offre une place...
voulez-vous l'accepter ?...
Et je me jetai dans ses bras en lui disant :
Disposez de moi et de ma vie...
je ne vous quitterai plus,
je partagerai vos peines et vos chagrins...
—C'est bien, me dit-elle avec émotion ;
présentez-vous demain au palais,
et demandez la dame dont je vous donne le nom.
Elle écrivit alors sur le comptoir deux mots
que j'ai pris, que j'ai là...et les voici.

when yesterday evening
a carriage stopped at the door,
a lady got out of it—it was my lady...
'Important business too long
to explain had detained her...
and besides she could not leave
home when she chose...
and yet she was anxious
to come and pay her debts herself'...
While she was speaking she observed
that I had still tears in my eyes,
although I hastened
to dry them when she arrived.
I was compelled to tell her
of my distress, position,
and the trouble in which I was:...
She was so kind...
and I was so put out !
At last I told her about everything,
except about Mr. Masham...
and when she heard that I intended,
this morning, to go to the Duchess of Northumberland...
she said :
'Do not go there,
you would be unhappy...
besides the place is filled up...
but my child,
in society and at Court I keep up
a large establishment...
in which, unfortunately,
I am not always the mistress...
Never mind, I offer you a place there...
will you accept it ?...
I threw myself into her arms, saying :
Do what you like with me and my life...
I will never leave you,
I will share your griefs and your sorrows.
—Very well, said she with much emotion ;
present yourself to-morrow at the palace,
and ask for the lady whose name I give you.
She then wrote on the counter two words
which I took and which I have here...here they are.

Masham.

C'est très-singulier...

'Tis very singular...

Bolingbroke.

Et ce papier, peut-on le voir ?

May we see the paper ?

Abigail.

[*le lui donnant.* [*giving it him.*

Certainement !... Certainly !...

Bolingbroke.

[*souriant.* [*smiling.*

Ah ! ah ! rien qu'à sa bonté, Ah ! Ah ! From her kindness alone
je l'aurais devinée. I should have guessed it.
(*A Abigail.*) Ce mot a été écrit devant vous, (*To Abigail.*) Was this word written before you
par votre nouvelle protectrice ?... by your new protectress ?

Abigail.

Oui vraiment... Est-ce que, par hasard, Yes, of course... Do you happen
vous connaîtriez cette écriture? to know the writing ?

Bolingbroke.

[*froidement.* [*coolly.*

Oui, mon enfant... Yes, my child...
c'est celle de la reine. it is the Queen's writing.

Abigail.

[*avec joie.* [*joyfully.*

La reine !... est-il possible ? The Queen...Can it be possible ?

Masham.

[*de même.* [*joyfully.*

La reine vous donne The Queen offers you
une place auprès d'elle... a place near her person...
et sa protection !... et son amitié... her protection !...and her friendship...
voilà notre fortune assurée à jamais. Your fortune is made for ever.

Bolingbroke.

[*passant entre eux deux.* [*passing between the two.*

Attendez, mes amis, attendez... Wait, my friends, wait...
ne vous réjouissez pas trop d'avance ! do not rejoice too soon !

Abigail.

C'est la reine qui l'a dit, The Queen herself said so,
et une reine est maîtresse chez elle ! and the Queen is mistress in her own house !

Bolingbroke.

Pas celle-là...Douce et bonne par caractère, Not that one...Gentle and good in disposition,
mais faible et indécise, but weak and undecided,
n'osant prendre un parti not daring to take any side
sans prendre l'avis de ceux qui l'entourent, without asking the advice of those who surround her,
elle devait nécessairement she must of necessity
se laisser subjuguer allow herself to be ruled
par ses conseillers et ses favoris, by her councillors and favourites,
et il s'est trouvé près d'elle and there happened to be about her person
une femme à l'esprit ferme, a woman with a strong will,
résolu et audacieux, resolute and bold,
au coup d'œil juste et prompt, with an accurate and rapid glance,
qui vise toujours droit et haut !... which is always directed straight and high !...
c'est lady Churchill, It is Lady Churchill,
duchesse de Marlborough, Duchess of Marlborough,
plus grand général que son mari lui-même, a greater general than her husband himself,
plus adroite qu'il n'est vaillant, more skilful than he is valiant,
plus ambitieuse qu'il n'est avare, more ambitious than he is miserly,
plus reine enfin que sa souveraine, more a queen, in short, than her sovereign,
qu'elle conduit et dirige par la main... whom she leads and directs with her hand...
la main qui tient le sceptre. that hand which holds the sceptre.

Abigail.

La reine aime beaucoup cette duchesse ? Does the Queen then love this Duchess much ?

Bolingbroke.

Elle la déteste !... She hates her !...
en l'appelant sa meilleure amie !... although all the while she calls her her best friend!...
et sa meilleure amie le lui rend bien. and her best friend pays her back in her own coin.

Translate into French the following sentences taken from the 'Verre d'Eau.'

Scene 3.

Now I have made up my mind. We were in bad circumstances. It was so difficult for me to find her. They were anxious (tenir à) however to come themselves. We should have guessed it from their kindness alone. I hate her and she pays me back in my own coin. If that is the case we have some hope. What goodness ! I have not much faith in it. Another affair which I have so much at heart.

(*To be continued.*)

Jeanne d'Arc, by Lamartine.

TRANSLATED BY A. M. BOWER,

Late Master in University College School, London.

JEANNE D'ARC. JOAN OF ARC.

XII.

Son père, homme d'âge et austère, Her father, an aged and austere man,
entendit avec peine ces bruits heard with sorrow these reports
de visions et de merveilles of visions and miracles
sous son toit de paysan. under his peasant roof (= in his humble home).
Il ne croyait point sa famille digne de ces faveurs dangereuses du ciel, He did not consider his family worthy of these dangerous heavenly visions,
de ces visites d'anges et de saintes of these visits of angels and saints
qui faisaient causer ses voisins. which made the neighbours gossip.
Toute relation avec les esprits All connection with spirits
lui était suspecte, was suspected by him,
à une époque surtout où especially at a time when
la crédulité superstitieuse superstitious credulity
attribuait tant de choses attributed so many things
aux mauvais esprits, to wicked spirits,
et où l'exorcisme et le bûcher punissaient tout commerce avec le monde invisible. and when exorcism and the stake punished all intercourse with the unseen world.
Il attribuait ces mélancolies et ces illusions de sa fille à des désordres de santé. He (her father) attributed this melancholy and these illusions of his daughter to a bad state of health.
Il désirait la marier, He wished to get her married,

afin que l'amour d'un époux
et des enfants apaisât son âme,
et que les distractions de la mère de famille
fissent évaporer ces imaginations.
Il poussa quelquefois
l'incrédulité jusqu'à la rudesse ;
il dit à Jeanne que,
's'il apprenait qu'elle donnât créance
à ses prétendus entretiens
avec les esprits tentateurs
et qu'elle se mêlât
aux hommes de guerre,
il la voudrait voir
noyée par ses frères,
ou qu'il la noierait lui-même
de ses propres mains.'

so that her love for her husband
and her children might soothe her mind,
and (in order that) the thoughts of the mother of a family
might cause these thoughts (fancies) to pass away.
Sometimes he pushed
his unbelief to harshness ;
he told Joan that,
'if he found that she gave credence
to these pretended conversations
with tempting spirits
and if she mingled with
men of war (soldiers),
he would like (wish) to see her
drowned by her brothers,
or he would drown her himself
with his own hands.'

XIII.

Ce déplaisir de sa mère
et ces menaces mêmes
de son père n'étouffaient
ni les visions ni les voix.
Obéissante en toute autre chose,
Jeanne désirait obéir même en ceci ;
mais l'inspiration était
plus obstinée que la volonté.
Le ciel devait être obéi
avant les hommes,
et le prodige était pour elle
plus impérieux que la nature.
Elle gémissait de désobéir,
et elle suppliait Dieu
de lui épargner ces efforts
qui déchiraient son cœur.
Elle espérait bien
obtenir plus tard le congé
et le pardon de ses parents,
comme, en effet,
ils lui pardonnèrent
quand sa gloire eut justifié
à leurs yeux sa désobéissance.
L'inspiration est comme le génie :
on ne la couronne
qu'après l'avoir combattue.

The displeasure of her mother
and even the threats
of her father stifled
neither the visions nor the voices.
Obedient in everything else,
Joan wished to be obedient even in this ;
but the inspiration was
stronger than her will.
Heaven must be obeyed
before man,
and the heavenly sign was for her
more imperious (authoritative) than nature.
She lamented her disobedience,
and she besought the Almighty
to spare her these struggles
which tore her very soul.
She hoped indeed
later to obtain the leave (permission)
and the pardon of her parents,
as, in fact,
they pardoned her
when her glory had justified
in their eyes her disobedience.
Inspiration is like genius :
we only crown it
after having fought with it.

XIV.

Mais il y avait à côté de Jeanne
un homme de son sang,
plus simple que son père,
ou plus tendre ou plus enthousiaste,
dans le sein de qui
la pauvre inspirée trouvait

But there was at Joan's side
a man of her own family,
more simple than her father,
or more tender and enthusiastic,
in whose heart
the poor inspired (girl) found
créance ou du moins pitié ;
c'était son oncle,
dont l'histoire aurait dû conserver
la figure et le nom,
car il fut le premier croyant
à sa nièce et le premier complice
de son génie.
Ces seconds pères, dans les familles,
sont souvent plus paternels
que les pères véritables,
et ils ont plus de faiblesse
pour les enfants de la maison,
parce qu'ils se défient
moins de leur amour
et qu'ils aiment par choix
et non par devoir.
Tel paraît avoir été
l'oncle de Jeanne,
le père de prédilection,
le consolateur, le confident,
puis enfin l'intermédiaire
séduit par son cœur
entre sa nièce et le ciel.
Pour soustraire Jeanne
aux obsessions et aux reproches
de son père et de ses frères,
l'oncle la prit quelque temps
chez lui, sous prétexte de soigner
sa femme alitée.
Jeanne profita de ce court séjour
loin des yeux de ses parents
pour obéir à ce qui lui commandait
dans l'âme.
Elle pria son oncle
d'aller à Vaucouleurs,
ville de guerre, voisine de Domremy,
et de réclamer l'intervention
du sire de Baudricourt,
commandant de la ville,
pour qu'elle pût accomplir sa mission.
L'oncle, séduit par sa nièce
et sans doute poussé par sa femme,
se rendit avec simplicité à leurs désirs.
Il alla à Vaucouleurs
et rendit au sire de Baudricourt
le message dont
il s'était complaisamment chargé.
L'homme de guerre écouta
avec une indulgente dérision le paysan :
il semblait

credence or at least pity ;
that was her uncle,
of whom history ought to have preserved
the portrait and the name,
for he was the first believer
in his niece and the first who was aware
of her genius.
The second fathers, in families,
are often more fatherly
than the real fathers,
and they have more indulgence
for the children of the house,
because they mistrust
their love less,
and because they love from choice
and not from a feeling of duty.
Such appears to have been
Joan's uncle,
the father of her choice (love),
her comforter, her confidant,
then finally her mediator
overcome by his love
between his niece and heaven.
To protect Joan
against the importunate remonstrances and reproaches
of her father and brothers,
her uncle took her for some time
to his home, under the pretence of taking care of
his bedridden wife.
Joan profited by this short stay
far from the eyes of her parents
to obey that which commanded her
in her soul.
She begged her uncle
to go to Vaucouleurs,
a garrison town, near to Domremy,
and to claim (demand) the intervention (mediation)
of the Lord of Baudricourt,
commandant of the town,
in order that she might fulfil her mission.
The uncle, won over by his niece
and doubtless urged on by his wife,
good-naturedly yielded to their wishes.
He went to Vaucouleurs
and delivered to the Lord of Baudricourt
the message of which
he had so kindly taken charge.
The officer in question listened
with indulgent scorn to the peasant :
it seemed to him

qu'il n'y eût qu'à sourire,
that there was nothing to do but smile,

en effet, de la démence
in fact, at the madness

d'une paysanne de dix-sept ans
of a peasant girl of 17 years of age

s'offrant à accomplir pour le Dauphin
who offered herself to accomplish for the Dauphin

et pour le royaume
and for his kingdom

ce que des milliers de chevaliers,
what thousands of cavaliers,

de politiques et d'hommes d'armes
of politicians and soldiers

ne pouvaient faire
could not effect

par la force du génie et des bras.
by the force of genius and of arms.

'Vous n'avez autre chose à faire,
'You have nothing else to do,

dit Baudricourt au messager
said Baudricourt to the messenger

des miracles en le congédiant,
with the miracles as he dismissed him,

que de renvoyer votre nièce,
than to send back your niece,

bien soufflетée, chez son père.'
after having well chastised her, home to her father.'

L'oncle revint, convaincu
The uncle returned, convinced

sans doute par l'incrédulité
no doubt by Baudricourt's

de Baudricourt et résolu
want of belief and resolved

d'enlever pour jamais cette illusion
to do away for ever with this illusion

de l'esprit des femmes.
in the minds of women.

Mais Jeanne avait tant d'empire
But Joan had so much influence

sur lui, et la conviction
over him, and his firm faith

la rendait si éloquente,
made her so eloquent,

qu'elle reconquit promptement
that she quickly regained

la foi perdue de son oncle
the lost faith of her uncle,

et qu'elle lui persuada
and that she persuaded him

de la mener lui-même à Vaucouleurs,
to take her to Vaucouleurs,

à l'insu de ses parents.
unknown to her parents.

Elle sentait bien que c'était
She felt plainly that it was

le pas décisif
the decisive step

et qu'une fois hors du village
and that once out of the village

elle n'y rentrerait jamais.
she would never again re-enter it.

Elle fit confidence de son départ
She confided her departure

à une jeune fille
to a young girl

qu'elle aimait tendrement,
whom she tenderly loved,

nommée Mangète, et elle pria avec elle
called Mangete, and she prayed with her

en la recommandant à Dieu.
while committing her into the hands of God.

Elle cacha son dessein à celle
She concealed her design from her

qu'elle aimait encore davantage
whom she loved still more dearly

et qui s'appelait Haumette,
and who was called Haumette,

'craignant, dit-elle après,
'fearing, said she afterwards,

de ne pouvoir vaincre sa douleur
her inability to overcome her grief

de la quitter
on leaving her

si elle lui disait adieu ;
if she bade her adieu ;

elle pleura beaucoup en secret
she wept much in secret

et vainquit ses larmes.'
and conquered her tears.'

XV.

Vêtue d'une robe de drap rouge,
Dressed in a red cloth gown,

selon le costume des paysannes
according to the customs of the peasants

de la contrée, Jeanne partit
of her country, Joan set off

à pied avec son oncle.
on foot with her uncle.

Arrivée à Vaucouleurs,
On arriving at Vaucouleurs,

elle reçut l'hospitalité
she was hospitably entertained

chez la femme d'un charron,
by the wife of a wheelwright,

cousin de sa mére.
her mother's cousin.

Baudricourt, vaincu par l'insistance
Baudricourt, overcome by the importunities

de l'oncle et par l'obstination
of the uncle and by the persistency

de la nièce, consentit à la recevoir,
of his niece, consented to receive her,

non par crédulité mais par lassitude.
not from belief but out of weariness.

Il fut ému de la beauté
He was touched by the beauty

de cette jeune paysanne,
of this young peasant girl,

que son chevalier Daulon
whom his captain Daulon

dépeint en ces termes
describes in these words

vers cette époque :
about this period :

'Elle était jeune fille,
'She was a young girl,

belle et bien formée,
beautiful and well formed,'

dit-il en décrivant chastement
said he, while describing chastely

jusqu'aux grâces de la femme.'
even the very charms of the woman.

Baudricourt l'ayant interrogée,
Baudricourt, having interrogated her,

Jeanne lui dit avec un accent
Joan spoke to him in a tone

de fermeté modeste
of modest firmness

qui prenait son autorité
which derived its authority

non en elle-même,
not from herself,

mais dans ce qui
but from what

lui avait été inspiré d'en haut :
had been inspired into her from on high :

'Je viens à vous
'I come to you

au nom de Dieu, mon Seigneur,
in the name of God, my Master,

afin que vous mandiez au Dauphin
in order that you should send word to the Dauphin

de se bien tenir où il est,
to be on his guard where he is,

de ne point offrir de bataille
not to offer battle

aux ennemis en ce moment,
to the enemy at the present time,

parce que Dieu lui donnera
because God will send him

secours dans la mi-carême.
succour in Lent.

Le royaume, ajouta-t-elle,
The kingdom, continued she,

ne lui appartient pas,
does not belong to him (the Dauphin),

mais à Dieu, son Seigneur.
but to God, his Master.

Toutefois il lui destine le royaume ;
Nevertheless, God destines the kingdom for him ;

malgré les ennemis, il sera roi,
in spite of his enemies, the Dauphin will be king,

et c'est moi
and it is I

qui le mènerai sacrer à Reims !'
who will conduct him to be crowned at Rheims !'

Grammatical Notes, Questions, Sentences, and Pieces for Translation to Jeanne d'Arc.

CHAPTER XII.

Causer, to talk ; causeur, talker ; causerie, pleasant conversation ; causeuse, a settee ; causette, a chat. Le mal = evil. Distractions = change of thought and thoughtlessness. *Rude* does not mean *rude*, but *hard*. *Dur* = hard, rough. Impoli = uncivil, rude. *Créance* = credence, credit, debt owing to the *créancier*, creditor ; *le débiteur* owes *une dette*, a debt. Et *qu'*elle se mêlât (*que* put for *si* takes subj.).

CHAPTER XIII.

Bien added to a *verb* intensifies its meaning.

CHAPTER XIV.

Se défier *de* (to mistrust), but se fier *à* (to trust). L'Esprit consolateur or Le consolateur, the Holy Ghost. Se soustraire *à* (= to save or escape from); se soustraire *de* (= to abstract from). Commander quelque chose *à* quelque (hence *lui* commandait), Voisin is both noun and adj. The scriptural '*thy neighbour*' = ton prochain (invariable). Rendre = to give back; se rendre = to yield or betake oneself. La politique = policy; le politique = politician. Note: à mon (ton, son, notre, votre, leur) insu = without my (thy, his, our, your, their) knowledge. Au vu et au su de = with the full knowledge of. Elle cacha son dessein à (cacher always takes à = from; but *se* cacher *de*). Dessein = plan; dessin = drawing.

CHAPTER XV.

Mi = half; middle; mid. A mi—côte = half-way up (the hill). En référer à = to submit the case to. *Le curé* is the priest in charge, *i.e.*, the rector, vicar, incumbent, but *le vicaire* is the *curate* of *le curé*.

(To be continued.)

—o—

Our Certificate Class.

BY DR. GEORGE BEACH, M.A.

Head Master of Christ Church School, Macclesfield.

GEOGRAPHY.

General Remarks.— Geography, as ordinarily studied, is of little use for the purposes of intellectual training, appealing (as it does) almost entirely to one of the lowest mental faculties, the memory. John Stuart Mill says, 'It has always seemed to me a great absurdity that History and Geography should be taught in schools, except in the elementary ones for the children of the labouring classes, whose subsequent access to books is limited.'

Notwithstanding, more than any other people, Englishmen, as a commercial and colonising nation, require for utilitarian purposes a sound and somewhat extensive knowledge of geographical facts; and now that the franchise is extended to the masses, whose suffrages decide measures involving the welfare or disaster of millions subject to them (every Englishman rules ten Hindoos), it is incumbent upon this Imperial race, whose pro-consuls rule immense territories, to have within easy reach the materials for forming at least approximately correct judgments.

Taking this view, it is just and wise of the Department to insist so strenuously, and dwell so perpetually, upon the geography of our Empire. Knowledge should begin at home.

The questions propounded offer, also, an exceedingly ample choice, are as a rule very fair ones, and a considerable proportion are such as an intelligent voter could say *something* about. After a close scrutiny of about five hundred questions we calculate that female students can secure forty per cent., and male students twenty-five per cent. (even including Physical Geography) of the maximum number of marks, by a thorough acquaintance with the geography of Hindostan; and the recent extension of 'Further India' by the annexation of Burmah will certainly tend to maintain this high per centage. After an exhaustive analysis of the aforesaid five hundred questions, we fail to discover any classification that would really be of practical use to us; but, speaking generally, the following points seem the favourites, and are touched upon nearly every year. Almost every paper contains a historical question, Notes of lesson, 'where and what' question, and queries upon railways, government, races, and productions; lists of our possessions too are very frequently demanded.

As to Method of Study.—The map should be ever under the eye, and no information should be read without the bodily or mental vision viewing the associated district.

Let our students strive to cultivate what we will call (for lack of a better name) imaginative or associative memory. We ourselves (and we know many other instances) having forgotten a fact, can frequently picture before us the requisite page or map, and re-read the desired information. The eminent blindfold chess-player, Mr. Blackburne, has told us that this is his *modus videndi et ludendi et vincendi*.

We do NOT recommend the traditional method, still applicable to some subjects, and so often insisted upon, of making one's own abstract of geographical information. There being so many serviceable epitomes published, and even the larger geographies denoting the salient features by large type, it is simply waste of time.

The student can, by reading only, digest at least five pages, whilst compiling a written synopsis of one, and by his own freely made marks in the margin of the manual, can distinguish what he considers essential, where his own views differ from the compilers, or where the necessities of this examination demand. This abstract-making was 'all very well' in the days of antiquated, unsuitable and inferior compilations, but philanthropic publishers and litterateurs have happily freed the student of 1888 from much, though not the whole, of this drudgery.

When once the primary features of a country are known, the Physical Geography, studied conjointly, should enormously assist with its associative and deductive aid.

Sometimes the candidate is *required* and sometimes *advised* to answer specified questions. Let both the command and the counsel be considered equally imperative.

Map-drawing can scarcely have its importance exaggerated. One question, at least, is always, and oftentimes several, devoted to it. In the Syllabus itself, for females, it is placed in the foreground. To show the prevailing tendency it will be merely sufficient to reproduce 'my lLords' *ipsa verba*, which may vary year by year.

(1) 'Candidates must draw one map.' (2) 'One map at least should be attempted.' (3) 'Map-drawing, if well done, will obtain a large number of marks.' (4) 'Illustrate by small sketch maps and diagrams.' (5) 'Small sketch maps or diagrams may be drawn to illustrate any answer, at the candidate's discretion.' (6) 'Every map should be drawn on a scale sufficiently large to occupy all the blank space available. If the candidate put in and correctly number the lines of latitude and longitude, it will add to the value of the exercise. Places, &c., must not be indicated by letters or figures, referring to a list of names at the side, but the names themselves must be inserted in the map.'

A red and blue lead, wherewith to colour his map, should be taken into the Examination by every candidate. This process of colouring, occupying but a short time, will certainly not metamorphize a bad map into a good one, but will considerably enhance the value of the latter.

Despite all contrary canons, we must here, for once, dogmatize (and the same principle applies to embellishing needlework), for we speak that we do KNOW. Do not forget to practise maps of rivers and seas.

Physical Geography is required only from male examinees, but the questions sometimes assume that females have assimilated its information and principles in their first year course.

Very easy is our task under this head, for the Syllabus details the particulars required, and the Department cling very closely, in the questions set, to their formulated programme.

On all the six enumerated divisions, a question will probably be asked, and perhaps any three will be ordered to be answered, whilst four other queries may be upon the remainder of the course.

Highly profitable, therefore, will it be to study attentively Physical Geography, not only on account of its intrinsic importance, but also for the aid it lends to the intelligent grasp (and therefore remembrance) of the other branches of Geography. Any male student in training, or acting teacher, who has not passed the Geography of the First Year with credit, who has failed altogether, or who has not been examined on First Year Papers, must take up the First Year Geography, even if going in for Second Year Papers.

The foregoing regulation, which also applies to History and the arrangement of the Certificate curriculum into six groups, was introduced for the Examination at Christmas, 1886.

Physical Geography, properly so called (as distinguished from the Geography of physical features) first appeared at Christmas, 1887.

HISTORY.

The superficial resemblance between Geography and History is very striking, and many of our remarks about the former, as regards its general character, its text books, and its methods of study, are equally applicable to the latter.

Moreover, History, apart from Geography, cannot be properly understood. The Department, therefore, has very properly placed them in the same group, and under the same regulations, and has justly appraised their elementary value, by requiring them only from new examinees, or unsuccessful candidates on the First Year Papers.

History, which consists merely of the acquisition of facts, and is not deductive and comparative, is of merely antiquarian value, and this lower level is all that can be aimed at under present conditions.

But 'History repeats itself,' and when its cycles are understood, when of its phenomena the causes and effects are duly observed and correlated, so that the teaching of the past instructs us as to the problems of the present, or near future, then its value is practically and superlatively high.

This ideal we cannot now even aspire to, although to every influential citizen it is an essential, unless he desire to be a political charlatan.

Although the males and females have different 'periods' to study, it will be found that the questions given to both sexes are drawn up on the same lines. The males may advantageously work according to the five sub-divisions laid down for the guidance of the females, paying also particular attention to—A, Lives of eminent men; B, Detailed accounts (with plan) of great battles; and C, The most important dates.

Judging from past questions and present events, we advise special attention to be also given to the Growth of Education—Development of Liberty of the Press—Parliamentary Representation—Privileges of Members of Parliament—Composition of the Cabinet—National Debt—The Constitutional ties uniting the various parts of the British Isles—History of Local Government—Relation of Imperial and Colonial Governments—History of Ireland, Hindostan and South Africa—The Tithe Question—and the Growth of Navy and Army, carefully noting the history and present condition of our auxiliary forces. For the last two years, the candidate has only been called upon to answer about 50 per cent. of the given questions, and as these have been within the syllabus, and of a reasonable character, no complaint lies under this 'head.'

The syllabus for females is the same as last year's. They will probably be allowed three hours, and the males two-and-a-half hours for answering.

We recommend our students—I. To make themselves complete masters of a rather scanty general historical outline; II. To study each of the given divisions separately; III. To study each period or reign by itself; IV. To learn thoroughly the most important dates. This method will most assist the memory. It binds the facts together with the ties, both of contemporaneity and sequence, and is analogous to testing registers by addition of horizontal and vertical columns. The dates too will associate the events.

Some people cannot remember dates. For these, and none other, we recommend some system of MEMORIA TECHNICA. (*See below.*)

The average male student will probably require to make an abstract of 'McCarthy.' McLeod's 'Constitutional History' should be used.

At the request of numerous correspondents we append an account of 'The Cabinet' from the pen of Mr. Gladstone.

'THE CABINET.'

(Inserted by special request.)

'1. *Relations of the Cabinet to (a) the Crown, and (b) the Parliament.*

'Upon the Cabinet it devolves to provide that the Houses of Parliament shall loyally counsel and serve the Crown, and that the Crown shall act strictly in accordance with its obligations to the nation. In the face of the nation, the Sovereign and the Ministers are an absolute unity. The one may concede to the other; but the limit of concession by the Sovereign is at the point when he becomes willing to change his Government—by the Ministers when they become unwilling to bear the responsibility of all that is done in the Crown's name.

'But the Cabinet has also relations with "the Lords," which need not however be one of entire unity, for their votes cannot doom it to capital punishment. On the confidence of the Commons it is immediately and vitally dependent.

'2. *Threefold (or fourfold) capacities of Cabinet Ministers.*

'Every Minister acts in three capacities: (*a*) as administrator of a department; (*b*) as a member of Parliament; (*c*) and as a confidential adviser of the Crown. Two Ministers possess a fourth capacity, viz., that of leaders of the Lords and Commons. These suggest and fix the course of business, take the initiative in ceremonial procedure, and advise the Houses in any difficulty.

'3. *Internal relations of the Cabinet.*

'The Cabinet is an unity, and no member in his single capacity can advise the Crown, and therefore it is a prime office of discretion for each Minister to settle what are the departmental acts in which he can presume his colleagues' consent, and in what more delicate, weighty or peculiar cases he must positively ascertain it.

'4. *The Premier.*

'The Premier has no power over his colleagues; he has no title to override them in their departments; his vote counts only as one of theirs; he governs them by influence only. But they are appointed or dismissed by the Sovereign on his advice, and any weighty business would commonly go to him, before being submitted to the Cabinet. He has many audiences with, and reports to, the Sovereign its proceeding. He is in these bound not to counterwork the Cabinet, nor to undermine the position of his colleagues in the royal favour. As the Cabinet stands between the Sovereign and Parliament, so he stands between the Sovereign and his colleagues.

'As a rule the Premier's resignation dissolves the Cabinet, but the defection of any other member only creates a vacancy, except when the balance of forces is exceeding delicate.'—(*Adapted from an article by Mr. Gladstone.*)

ANSWERS TO CORRESPONDENTS.

We shall be pleased to reply briefly, and through this column, to any seeking information or advice.

Answers demanding urgency will be promptly forwarded per post on receipt of stamped and addressed envelope.

A. W., West Vale, Halifax; H. M., Dunkinfield; C. M., Bodmin; answered per ordinary letter.

Historicus and others will find their wishes met in this month's articles.

MEMORIA TECHNICA.

Figure.	0	1	2	3	4	5	6	7	8	9
Substituted vowel.	y	a (1st vowel)	e (2nd vowel)	i (3rd vowel)	o (4th vowel)	u (5th vowel)	au (1 + 5)	oi (4 + 3)	oo (4 + 4)	ou (4 + 5)
Substituted consonant.	r (Round)	b (1st consonant)	d (Duo)	t (Three)	f (Four)	l (L = fifty)	s (Six)	p (SePtem)	k (OKto)	n (Novem)

Examples.

Battle of Minden, 1759 (759) = Mindpun ('p' = 7, 'u' = 5, 'n' = 9).
Mutinies at Spithead and the Nore, 1797 (797) = Spitnorpoup ('p' = 7, 'ou' = 9, 'p' 7).
Battle of Waterloo, 1815 (815) = Water-kal ('k' = 8, 'a' = 1, 'l' = 5).
Reform Bill, 1832 (832) = Reforkid ('k' = 8, 'i' = 3, 'd' = 2).

These Mnemonics when once learned are never forgotten.
The thousand figure is not required, as no confusion can arise from its omission.

ROUTINE FOR AUGUST. (MALES.)

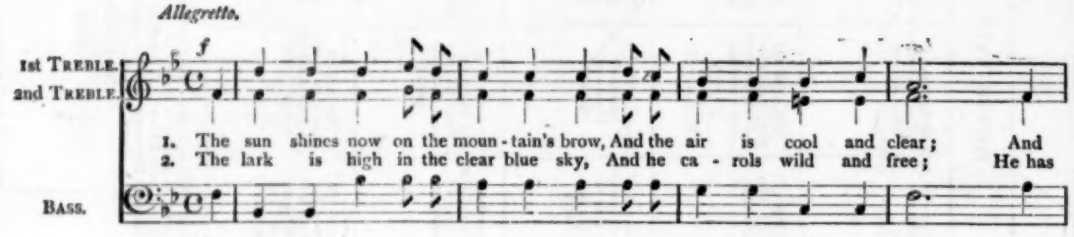
DAY	FIRST WEEK			SECOND WEEK			THIRD WEEK			FOURTH WEEK		
MONDAY	What provision would you make for training a 1st and 4th Year P.T. in the art of Teaching?	The algebraic proofs of the twelve 'Theorems' of Euclid, Book II.	Paraphrase Lines 92—107 of Cæsar, Act V. Scene 1	Deductions 199—210 of Egan, Part II.	Paraphrase Comus, Lines 153—169	All geography of England	Compare Milton and Dante (Macaulay)	Map of West Indies	History — Twenty-third chapter of McCarthy	Within what limits can the Teacher influence Habit and Character?	Deductions 234—248 of Egan, Part II.	Study the Adjective, Conjunction and Interjection
TUESDAY	Geography of our West Indian Possessions	Arithmetic or Algebra	Outlines of History, to end of Elizabeth's reign	Arithmetic or Mensuration	History — Twenty-second chapter of McCarthy	Notes of a First Lesson on Algebra	Study the Adjective, Conjunction and Interjection	Revise Algebra	Wars with Wales and Scotland	Revise Euclid, Book IV.	Revise Notes of Comus	School Management. — Headaches, The Eyes, pp. 287—310 (Carpenter's Hygiene)
WEDNESDAY	The Binomial Theorem	The rules of the ordinary 'Syllogism' (Jevon's Logic Primer)	Deductions 388—40 of Egan, Part I.	The Binomial Theorem	Revise Euclid, Book II.	Write 30 lines of Composition upon the character of Octavius	Deductions 222—233 of Egan, Part II.	Paraphrase (about p. 14 of Essay on Milton) 'Of these principles then struggling for their infant existence..... as in the long run it always is with its enemies.'	Geography — Revise— The causes and effects of climate	Geography of Ceylon and Van Diemen's Land	Arithmetic or Algebra	History — Revise McCarthy
THURSDAY	Write 30 lines of Composition upon the Character of Antony	Write a Large-hand copy of the word 'Crystallization,' and 30 lines of the Small-hand copy 'Gray-eyed morn smiles on the frowning night'	Revise Euclid, Book I.	Geography of our West African Possessions	Arithmetic or Mensuration	Tables of Stuart and Hanoverian Dynasties	Arithmetic or Mensuration	History — Twenty-fourth chapter of McCarthy	Revise Algebra	Notes of Cæsar to end	Arithmetic or Algebra	Notes of Lesson on the Solar System
FRIDAY	Notes of Cæsar to end of Act V. Scene 5	The variations or irregularities of the Earth's motions	Arithmetic or Algebra	The Binomial Theorem	Canon Warburton's Article in our July issue on Pestalozzi	Deductions 211—221 of Egan, Part II.	Geography — Revise— Distribution of plants & animals	Revise the last eighteen Propositions of Euclid, Book III.	Write an essay upon Macaulay's position among English Authors	Deductions 249—259 of Egan, Part II.	Read carefully through the last half of the Essay on Milton	Geography of New Zealand
SATURDAY	Important Dates to end of Elizabeth	Notes of Cæsar to end of Act V. Scene 5	The Binomial Theorem	Ventilation (To p. 104 of Carpenter's Hygiene)	Revise Notes of Comus	The Log Book, The Half-Time, Attendance, Summary, and Admission Registers	Revise the first nineteen Propositions of Euclid, Book III.	Arithmetic or Algebra	Revise Geography of Australasia	Arithmetic or Mensuration	Outlines of History to end of Charles II. reign	Revise Algebra	Arithmetic or Mensuration	Important Dates to end of Charles II.	Algebra — Logarithms	Write out (for future use) a Summary of Canon Warburton's last Article on Pestalozzi

ROUTINE FOR AUGUST. (FEMALES.)

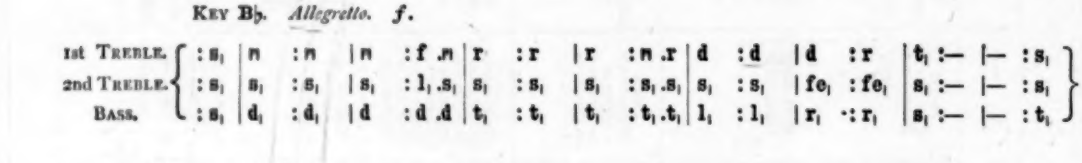
DAY	FIRST WEEK			SECOND WEEK			THIRD WEEK			FOURTH WEEK		
MONDAY	What provision would you make for training a 1st and 4th year P. T. in the art of Teaching?	Analyse, and Parse difficult words of Cæsar, Act V. Scene 3, Lines 33 to 46	Geography of our West Indian Possessions	Our Spanish Wars during the 18th Century	Revise any Arithmetic	Geography of South American Possessions	The ordinary poisons with their antidotes	The rules of the ordinary 'Syllogism' (Jevon's Logic Primer)	Map of West African Possessions	Revise any Arithmetic	Geography of West African Possessions	Write 30 lines of Composition upon 'The character of Cassius'
TUESDAY	Pitt's India Bill of 1784. Union with Ireland, 1800. Pitt's creation of Peers	Exercises in Mental Arithmetic	Paraphrase Lines 92 to 107 of Cæsar, Act V. Scene 1	Map of British Isles	Family of father, mother, and 4 children. Income 30/- per week. In what proportions should it be expended for Rent, Dress, Food, Education and Providence?	Practise Stocking-web stitch, Swiss-darning a hole, and Plain darn on linen	Ventilation (To page 86 of Carpenter's Hygiene)	Revise any Arithmetic	Revise any Geography	Outlines of History from 1783 to 1792	What are the requirements of the 3rd Stage of the Specific Subject, 'Domestic Economy'?	Practise any cutting-out wherein you are most deficient
WEDNESDAY	What are the requirements of the 2nd Stage of the specific subject 'Domestic Economy'?	Notes of Lesson on 'Housework'	Needlework — Practise any diagrams wherein you may be most deficient	Life of Adam Smith. Canals, 1761. Steam Engine, 1765	Arithmetic — Problems where the difference between the Principal and the Present Worth is given	Syntax of Adverbs and Prepositions	Revise any Geography of the British Isles	The changes effected in food by cooking. The ills attending bad cooking	Canon Warburton's Article in our June issue on Pestalozzi	Compare Addison's humour with that of Swift and Voltaire	Practise Hedge-tear and Cross-cut darns	The Log Book, the Half-time, Attendance, Summary and Admission Registers
THURSDAY	Map of West Indies	Needlework — Feather stitching, Herring-boning, and Knotting	Arithmetic — Any Stocks	School Managmt. — Headaches, the Eyes, pp. 287—310 (Carpenter's Hygiene)	Discuss the question whether 'The French cook more economically than the English'	Lives and works of Newton, De Foe, Swift, Richardson, and Fielding	Analyse, and Parse difficult words of Cæsar, Act V. Scene 3, lines 93 to 110	History during 18th Century of Nova Scotia, New Brunswick, Prince Edward Isle, Vancouver Island	Problems on Least Common Multiple, *e.g.*, bells tolling at different given rates—to find when they will synchronise	The various religions of the peoples of our Empire	In what cases, and how, should Heat be used as a curative agent?	Explain the principle of 'The Unitary Method'
FRIDAY	Describe the different methods of ironing. To what articles are they applicable? How would you guard against scorching?	¼ of a pole is in the mud, ¼ of a pole is in the water, 2 feet above water, find length of pole. Similar problems	Settlement of New South Wales, 1788. — Malta	Paraphrase Lines 68 to 82 of Cæsar Act V. Scene 5.	Cut out and tack together the sleeve of a boy's shirt, and set on wristband	Notes of Lesson on The Solar System	Explain the principles, working, and advantages of Co-operative Stores	Write 30 lines of Composition upon 'The character of Brutus'	Needlework — Plain	What is the range of the Teacher's influence as regards 'Habit' and 'Character'?	The persons alluded to in the Essay on Addison	Outlines of History from 1792 to 1801
SATURDAY	What is Macaulay's opinion of Addison's genius and attainments?	Treaties of Utrecht and Aix-la-Chapelle	Geography of our West Indian Possessions	Write a Large-hand copy of the word 'Crystallization' and 30 lines of the Small-hand copy 'Grey-eyed morn smiles on the frowning night'	Problems as to cost of painting or papering areas	Notes of Cæsar to end of Act V. Scene 5	Distinguish between contagion and infection, and classify ordinary diseases	Needlework — Plain	Practice Sums whose answers are in 'Weights or Measures'	Notes of Cæsar to end of Act V. Scene 5	Clock Sums — 1 Position of Hands. 2 True or denoted time	War of Austrian Succession	Syntax of Adverbs and Prepositions	Geography of Ceylon and Van Diemen's Land	Arithmetic — To reduce Sovereigns through (say) francs, gulden, etc., to dollars	Write out (for future use) a Summary of Canon Warburton's last article on Pestalozzi

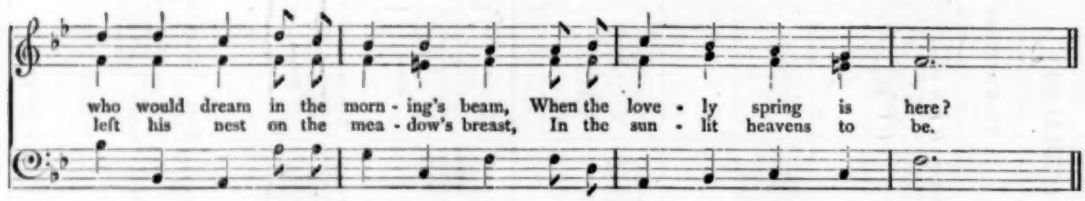
THE PLOUGH.

Allegretto.

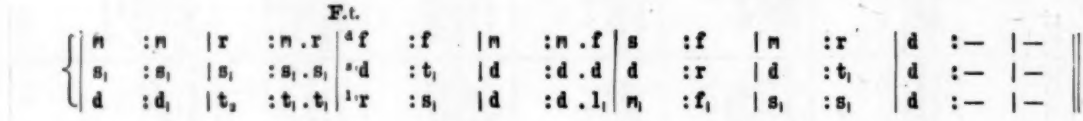

1st TREBLE.
2nd TREBLE.
BASS.
1. The sun shines now on the moun - tain's brow, And the air is cool and clear; And
2. The lark is high in the clear blue sky, And he ca - rols wild and free; He has

KEY B♭. *Allegretto.* *f.*



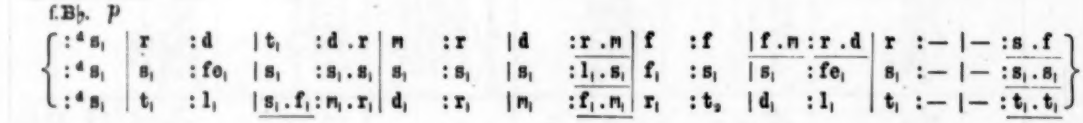

who would dream in the morn - ing's beam, When the love - ly spring is here?
left his nest on the mea - dow's breast, In the sun - lit heavens to be.

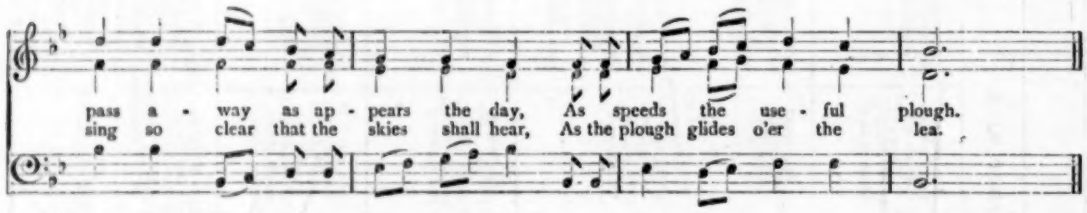
F.t.

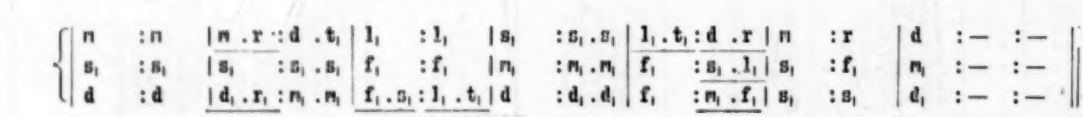


I'll haste with sped to the glitt' - ring mead, Where the mists are gath - er'd now; They'll
I can - not fly to the clear blue sky, Nor ca - rol wild and free; But I'll

f. B♭. *p*



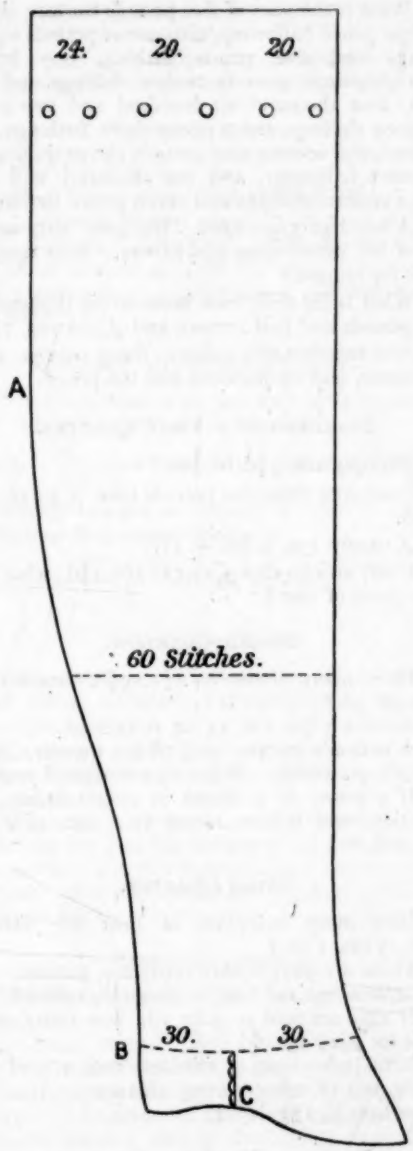

pass a - way as ap - pears the day, As speeds the use - ful plough.
sing so clear that the skies shall hear, As the plough glides o'er the lea.



Knitting Maps.

BY MRS. J. D. HARRIS.

GAITER FOR INFANT.



3 oz. Andalusian wool.

4 pins. No. 15 Chamber's bell gauge.

Cast on 64 stitches. 24, 20, 20.

Knit 1, purl 1, for 1 inch.

Make a row of holes by putting the wool forward and knitting 2 together.

Rib the rest of the leg, viz., knit 2, purl 2.

A. When you have knitted 4 inches decrease for calf in the centre of the pin with 24 stitches.

Decrease 4 times, with 6 rounds between each decreasing.

Knit the leg 10½ inches long.

To form the Heel.

B. Put 30 stitches on the back pin, 30 on the instep.

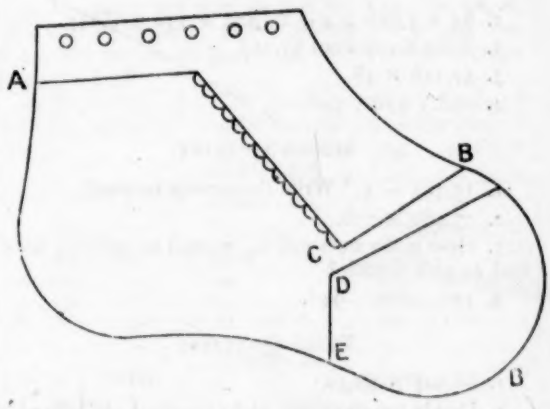
Knit 8 rows backwards and forwards on the heel pin. Cast off, and when you come to the end of the row pick up 4 loops, and rib round the instep, picking up 4 loops on the other side.

To form the Instep.

C. Knit the 2 first and 2 last of each succeeding row plain, and after the 2 first, and before the 2 last, decrease in every other row, by knitting 2 together. When reduced to 14 stitches, knit 2 plain rows, and cast off.

Put an elastic at the junction of the heel and instep, and a ribbon in the holes at the knee.

For little infants before they can walk many people prefer a gaiter with a foot to it, in which case the following pattern will be found to answer:—



When you have knitted to the ankle, make a row of holes.

A. Put 20 stitches on each side pin. 20 on instep. Rib about ½ an inch. Rib instep pin about 1½ inches more.

B. Knit 14 plain rows.

C. Pick up the side loops. Knit back, and pick up the corresponding loops on the other side. Knit 10 rows.

D. On the right side, when you come to the toe-pin, knit the first 2 and the last 2 stitches together. Knit to the end of the heel, and back to the other side. Also round the heel by knitting the 2 last stitches of each row together.

E. When the toe is reduced to 1 stitch knit the sole of the foot together and cast off. The pattern published August, 1887, answers admirably for the foot.

Quarterly Arithmetical Tests.

STANDARD I.—FIRST QUARTER.

1. 54, 307, 2, 163, 81

2. 693, 420

3. 578, 36

4. 11 × 2; 7 × 3; 4 × 8.

SECOND QUARTER.

1. 628, 50, 419, 7, 93

2. 405, 261

3. 734, 728

4. 6 × 3; 5 × 10; 7 × 6.

THIRD QUARTER.

1. 9, 74, 6, 580, 735

2. 347, 249

3. 902, 5

4. 4 × 12; 5 × 5; 6 × 9.

STANDARD II.—FIRST QUARTER.

1. 63 + 5,028 + 4 + 60,905 + 730 + 9,847.
2. Take 8,207 from 37,016.
3. 57,346 × 48.
4. 29d.; 47d.; 54d.

SECOND QUARTER.

1. 15,395 ÷ 5. Write the answer in words.
2. 37,486 × 716.
3. How many nuts will be wanted to give 37 boys and 49 girls 9 each?
4. 75d.; 88d.; 94d.

THIRD QUARTER.

1. 86,507 × 9,030.
2. Divide ten thousand eight hundred and seventy-nine by eleven.
3. In a school there are 12 classes and 38 boys in each class. How many boys are there in the school?
4. 107d.; 119d.; 136d.

STANDARD III.—FIRST QUARTER.

1. Divide 72,333 by 19.
2. How many times is 708 contained in four hundred and ninety-two thousand and sixty?
3. 318,500 ÷ 650.
4. Two boys visit an orchard and bring an equal number of apples. One goes 28 times and brings 45 each time. The other goes 35 times; how many apples does he bring each time?

SECOND QUARTER.

1. Take £8 8s. 8¾d. from £52 13s. 7¼d.
2. If a man can ride 58 miles a day, how many days would it take him to travel ten thousand two hundred and eight miles?
3. £913 15s. 7½d. + £562 18s. 11¾d. + £308 16s. 9¼d. + £674 11s. 10½d. + £430 17s. 8d. + £159 14s. 6¾d.
4. A horse and a donkey each draw 3,780 paving-stones. The horse draws 70 paving stones each journey, and the donkey 60. How many more journeys will the donkey take than the horse?

THIRD QUARTER.

1. What is the sum of five pounds thirteen shillings and four pence halfpenny, sixty-seven pounds eighteen shillings and five pence farthing, one hundred and eighty-three pounds twelve shillings and three pence, four thousand six hundred and two pounds seventeen shillings and a penny three farthings, thirty thousand and seventy-nine pounds eleven shillings and ten pence halfpenny, and two thousand and seven pounds sixteen shillings and seven pence farthing?
2. A boy had 3,040 nuts. He gave sixty-seven to each of his twenty-nine playfellows. How many had he left for himself?
3. What is the difference between six thousand and three pounds and half-a-crown and £798 10s. 7¼d.?
4. Add together fifty guineas, thirty crowns, twenty half-crowns, and six hundred and ten pence.

STANDARD IV.—FIRST QUARTER.

1. Multiply 16s. 7¾d. by 380.
2. From four thousand pounds take £3 15s. 10¼d. × 796.
3. £10,067 13s. 11½d. ÷ 11.
4. If 287 articles cost £27,521 16s. 1¼d., what would be the price of one?

SECOND QUARTER.

1. How many times is 17s. 9½d. contained in £272 4s. 3d.?
2. Reduce 3 qrs. 1 st. 13 lbs. to ounces.
3. A person's income is £78 per quarter, and he saves £1 5s. weekly. What does he spend yearly?
4. If a penny is 3 inches in circumference, how many times will it turn round on a path of 2 poles 2 yds. 2 ft.?

THIRD QUARTER.

1. How many half-pints of beer are there in 69 gals. 3 qts. 1 pt.?
2. There are 567½ square yards in a garden. How many square feet are there in 10 such gardens?
3. If eggs are sold at 3 for 2d., how many can be bought for £29 13s. 6d.?
4. John Jones loses 5 minutes from school every morning and 10 minutes every afternoon. What time does he lose in 170 days?

STANDARD V.—FIRST QUARTER.

1. What is the cost of 7,935 articles at 9s. 5¾d. each?
2. Find, by practice, the rent of a farm of 159 ac. 3 ro. 28 po. at £2 5s. 10d. per acre.
3. What is the price of 879 articles at £80 18s. 10¾d. each?
4. Find the cost for 3 years 219 days at 50 guineas per annum (1 year = 365 days).

SECOND QUARTER.

1. If a man walk 10 miles in 2 hrs. 20 min., how far can he walk in 21 minutes?

2. If 28 yards of silk cost £8 3s. 4d., what quantity can be bought for £10 4s. 2d.?

3. Bill:—

6 yds. at 4s. 9d. per yd.;
$9\frac{1}{2}$ yds. at 3s. 10d. per yd.;
$10\frac{1}{2}$ yds. at 1s. 8d. per yard;
40 rods at 2s. 6d. per dozen;
$8\frac{3}{4}$ yds. at 4s. 2d. per yd.

4. If 15 tons 14 cwt. 2 qrs. of coal cost £10 9s. 8d., what must be paid for 39 tons 17 cwt. 3 qrs.?

THIRD QUARTER.

1. $\frac{1}{6} + \frac{7}{10} + \frac{3}{4} + \frac{2}{5}$.

2. Take $\frac{3}{8}$ from $\frac{5}{6}$, and add $\frac{2}{3}$ to the result.

3. A tradesman bought 2 tons 8 cwt. 3 qrs. 6 lbs. of rice for £99 12s.; how much must he charge per cwt. in order to clear £14 5s. 6d.?

4. If a man going a journey ride $\frac{1}{3}$ and walk $\frac{1}{8}$, what part is left?

STANDARD VI.—FIRST QUARTER.

1. Divide the product of ·721 and 10·89 by the difference between 954·68 and a thousand.

2. $3\frac{5}{16} - 1\frac{7}{12}$, and multiply the difference by $\frac{7}{24}$.

3. Simplify 14·0367 − ·097428 + ·1396 − 12·745.

4. Reduce to a mixed number—

$$\frac{2\cdot5 - \cdot25}{\cdot\dot{6}} + (3\tfrac{1}{2} \div 2\tfrac{1}{3}).$$

SECOND QUARTER.

1. If a grocer buy $8\frac{1}{2}$ cwt. of sugar at $2\frac{1}{2}$d. per lb., and sell £8 9s. 2d. worth at the same price, what part of a ton has he left?

2. If a room 7 yards long take 42 yards of carpet 27 inches wide, how many yards will it take when it is a yard wide?

3. 7·875 tons + 16·27 cwt. + ·92 qr. + 50 lbs.

4. A man left $\frac{1}{4}$ of his fortune to his first son, $\frac{1}{5}$ to his second son, $\frac{1}{8}$ to his daughter, and the remainder to his wife. The wife's share was £1,610. What was the amount left?

THIRD QUARTER.

1. Find the interest on £350 for 19 months at $3\frac{1}{4}$ per cent.

2. A man owes £780 15s., and possesses £149 12s. $10\frac{1}{2}$d.; what can he pay in the £?

3. If £470 be lent for $2\frac{3}{4}$ years at $4\frac{1}{4}$ per cent., what sum will be returned at the end of that time?

4. A can make a suit of clothes in 4 days, B in 6 days, and C in 8 days. How long would it take them working together?

STANDARD VII.—FIRST QUARTER.

1. Find the simple interest on £59 15s. for $4\frac{1}{8}$ years at £3 5s. per cent.

2. By investing £4,000 for 5 months £70 is gained; what will be gained by investing £5,000 for 11 months?

3. If the sum of £298 5s. be gained on £3,579, what is the gain per cent.?

4. If 26 men in 35 days do $\frac{7}{8}$ of their work, how long will it take them to do the whole of it, if they work an extra quarter day each day?

SECOND QUARTER.

1. Simplify:—$\dfrac{5\cdot2 \times \cdot6}{\frac{5}{6} - \frac{3}{10}} \div \dfrac{2\cdot5 \div \cdot08}{\frac{1}{6} + \frac{1}{3}}$.

2. What is the average of the following sums of money:—£$9\frac{5}{6}$, £$2\cdot\dot{6}$, 9s. 10d., £1·325, and $\frac{1}{3}$ of a shilling?

3. A man owns property worth £4,675, and insures it at the rate of ·125 per cent.; what is his net income?

4. A person rode $2\frac{1}{2}$ hours at 10 miles an hour; then went $3\frac{3}{4}$ hours at 8 miles an hour; and then went at the rate of 6 miles an hour for 15 minutes. Find his average speed per hour.

THIRD QUARTER.

1. There is a mixture of milk and water containing 15 gals. 3 qts. Of this $11\frac{1}{9}$ per cent. is water. Find the quantity of each.

2. A dealer buys three horses at £30, £60, and £80 respectively, and sells them at profits of 10, 15, and 20 per cent. What is his percentage of gain on the whole?

3. If 40 qrs. are sold at 34s. 6d. a qr., 60 qrs. at 36s. a qr., 30 qrs. at 37s. a qr., 20 qrs. at 38s. 6d. a qr., and 10 qrs. at 39s. a qr., what is the average price per qr.?

4. By selling 47 yards of silk at 7s. per yard, 12 per cent. is gained; what sum is gained on the whole?

ANSWERS.

STANDARD I.

	FIRST.	SECOND.	THIRD.
1.	607.	1,197.	1,404.
2.	273.	144.	98.
3.	542.	6.	897.
4.	22; 21; 32.	18; 50; 42.	48; 25; 54.

STANDARD II.

	FIRST.	SECOND.
1.	76,577.	3,079.
2.	28,809.	26,839,976.
3.	2,752,608.	774 nuts.
4.	2s. 5d.; 3s. 11d.; 4s. 6d.	6s. 3d.; 7s. 4d.; 7s. 10d.

	THIRD.	
1.	781,158,210.	3. 456 boys.
2.	989.	4. 8s. 11d.; 9s. 11d.; 11s. 4d.

STANDARD III.

	FIRST.	SECOND.	THIRD.
1.	3,807.	£44 4s. $10\frac{1}{2}$d.	£36,947 9s. $8\frac{1}{4}$d.
2.	695 times.	176 days.	1,097 nuts.
3.	490.	£3,050 15s. $5\frac{3}{4}$d.	£5,204 11s. $10\frac{3}{4}$d.
4.	36 apples.	9 journeys.	£65 0s. 10d.

STANDARD IV.

	FIRST.	SECOND.
1.	£316 5s. 5d.	306 times.
2.	£981 0s. 1d.	1,776 oz.
3.	£915 4s. $10\frac{3}{4}$d. + 5.	£247.
4.	£95 17s. $10\frac{1}{2}$d.	164 times.

	THIRD.	
1.	1,118 hf.-pts.	3. 10,683 eggs.
2.	51,075 sq. ft.	4. 42 hrs. 30 min.

STANDARD V.—FIRST.

1. £3,760 17s. 2½d.
2. £366 9s. 10½d.
3. £71,150 9s. 5½d.
4. £189.

SECOND.

1. 1½ miles.
2. 35 yards.
3. £1 8s. 6d. + £1 15s. 5½d. + 17s. 6d. + 8s. 4d. + £1 16s. 5½d. = £6 6s. 3d.
4. £26 11s. 10d.

THIRD.

1. $2\frac{1}{9}$.
2. $\frac{3}{11}$.
3. £2 6s. 8d.
4. $\frac{11}{12}$.

STANDARD VI.

	FIRST.	SECOND.	THIRD.
1.	·17325.	½ ton.	£18 0s. 2½d.
2.	$16\frac{3}{8}$.	31½ yds.	3s. 10d.
3.	1·333872.	8 tns. 14 cwt. 2 qrs. 2 lbs.	£528 3s. 3d.
4.	$4\frac{1}{2}$.	£4,200.	$2\frac{3}{11}$ days.

STANDARD VII.

	FIRST.	SECOND.	THIRD.
1.	£8 8s. 3½½d.	·1536.	milk 14 gals., water 1 gal. 3 qts.
2.	£192 10s.	£2 17s. $5\frac{1}{11}$d.	$16\frac{2}{7}$ per cent.
3.	8¼ per cent.	£4,669 3s. 1½d.	£1 16s. 3½d.
4.	32 days.	$8\frac{8}{15}$ miles.	£1 15s. 3d.

Practical Needlework in Elementary Schools.

BY MISS J. W. WARREN,

Inspectress of Needlework to the Leicester School Board.

WE have now gone through the elementary exercises necessary to ensure the right holding of both needle and work, and are ready to begin to teach stitches. And here I pause to give advice about the materials. Several different methods have been tried from time to time with the same result that in the end props are discontinued, and the teacher returns to the ordinary materials, viz., plain white or unbleached calico and cotton. For the sake of those who prefer the help of props I would suggest one of three things—use for your first hemming the dotted calico, striped calico, or colored cottons with white or unbleached calico. Dotted calico can be bought for 6d. a yard at Moffatt and Paige's. The dots are so arranged as to enable a child to insert the needle at regular intervals, and by so doing get at once a *rightly-shaped stitch*. I have seen this tried in several schools, it is so far successful as to enable children at once to make stitches with very little supervision, but fails in that the help given by the dots prevents their exercising sufficient observation to get the same result when the transfer to ordinary calico takes place. The fixing is also a drawback, requiring very much attention and accuracy. Small country schools that are poorly staffed will, however, find it useful.

Striped calico is very useful, and has an advantage over dotted in that the fixing is without difficulties beyond those found in ordinary work, and can be bought at any draper's in the form of print, which should be washed before it is used. It will be at once seen that in using the striped calico no guide as to the height of stitch above and below the hem is given as in the dotted, only the regularity is ensured *laterally*; the shape of stitch, that is the direction in which to insert the needle, remains in the hands of the teacher.

We now come to the third, and, in my opinion, best help, viz., colored cottons on plain material. For whatever plan we try the end must come when the simple strip must be accomplished by each small child. A little rapidity in the beginning is bound to be sacrificed by the work on plain calico; but as the colored cottons are now a Code suggestion the child has absolutely nothing to unlearn. Even with all the good props suggested a bad or indifferent teacher will never succeed in teaching needlework thoroughly. With just a passing glance at the diagrams of these two calicoes we will pass on to the actual explanation of a stitch.

Plan.—Have ready pieces of coarse loose unbleached calico, 2 inches by 8 inches, fixed with a hem one-third of an inch wide. At least ten stitches of hemming should be done with a 6 needle and 36 black cotton, needle threaded and stuck ready for a stitch before giving to the child. Then place before each child a piece as above with a thimble.

Now let the thimbles be put on first. Of course drill for this is done with; but the work-placing, No. 6 drill, must be gone carefully through several times until the children can so place the work as to have the needle in exactly the right place upon the finger. (It will be remembered that it is placed ready for a stitch.) At this point a lesson in observation may be given. The child should be told to look at the needle, its point, its eye, its shaft, and, finally, the bit on the other side of the work, also the stitches already done; more can be done in this way to get the slope of stitch than in any other. Each child has a correct setting before it, and thus we approach as near to individual help as we possibly can. Having gone through this observation the needle may be grasped, as taught in combination drill, arranged with cotton in place, and the needle drawn slowly backwards (not through to the left). Notice that small holes are seen where it stood so long; these will serve for the first stitch setting. The needle should now be held up for inspection, and the command to put it in again exactly where it came from will give the slope at first without more trouble, this to be drawn out and repeated several times without altering needle in right hand, until understood. Then the directions in Sheet III., Stitch-drill 7, may be gone through; in this drill for hemming stitch children should be taught to look for the point of needle *rather between the finger and thumb* than over *thumb nail*, otherwise a straight and running hem is the result. Great care and infinite patience are needed for direction 2; the tendency to take the thumb away too soon must be overcome, and the combination of progressive movement *forwards*, with strong hold for guiding the needle, watched and insisted upon, as also the rapid leap of thimble to regain the eye of the needle.

The stitch drill should now form the regular lesson, and should be prefaced every day by the earlier ones necessary. Every stitch should be inspected by the teacher, who can use a candidate or monitor to assist if the class is large; later on the children may be allowed to do two, four, or six stitches, and then leave *one on the needle*. While it is desirous that children are not bored with slow methods it is equally necessary that they are not permitted to do too much unchecked. Nothing is more easily acquired than slovenly work. Indeed, I doubt whether a child ill-taught in these early lessons ever becomes expert

later on. The drill 7 is for *plain hemming*. Security and regularity are needed in this stitch; its use is principally to make neat the sides, edges, bottoms, &c., of all garments, and but for its occurrence in the Government Schedule first, I should certainly recommend its taking a third or fourth place in the teaching of needlework.

The slope of stitch leads to much argument amongst the uninitiated; but I feel sure only one opinion prevails amongst those who think the matter out. The right and wrong sides are exactly alike, the cotton forms a succession of the Roman figure V, and this is obtained only by attending to two points, viz., *point of insertion*, and *point of emergence* of the needle.

While it is absurd to teach a child to count the threads when hemming, it is equally absurd for a teacher to ignore threads altogether in calculation as to slope, distance, height and depth of the stitch. By giving distance of one stitch from another we regulate our work according to the relative coarseness or fineness of the material. For the guidance of the teacher let me therefore say that distance from stitch to stitch both above and below the hem fold should be about *four threads*, distance below the hem fold *one thread*, above it *two threads*. When such a piece is properly pressed and folded the *hem fold* will almost cover the one thread below, and thus produce the exact effect aimed at by only just a suspicion of the needle's insertion.

It will be better for a teacher to demonstrate this stitch many times upon the blackboard or, better still, let the children themselves do so upon their Kinder Garten perforating cards. Quite one half of the work of the rest of Schedule III. is done by hemming: this is my only apology for dwelling so long upon it. A child should be taught to look back at the *place where the needle was put in before*: if it is told to look at the last stitch it is too bewildering, seeing that there are three parts to remember. One excellent Infants' Mistress I know adopts an ingenious method which I give for those who may like stepping stones better than others. After doing the last stitch the children are taught to catch hold of the cotton near where it springs from the calico and place it down towards the left, following with their eyes the direction of the preceding stitch, getting it parallel with it, then by cleverly manipulating it with the left thumb hold it in its place until the needle point is put in. This plan certainly answers if we want the right direction and regular hemming at all costs, but not if any degree of rapidity is to be attained.

The child should keep the same piece from one lesson to another. A pencil mark may be made where the lesson of one day ends.

When the *striped* calico is used the needle must be inserted at each stripe and brought through above on a stripe these should be about twenty to an inch, which will give ten stitches. This will be found to be quite enough and a little attention to such details will more than repay a teacher, I have found it useful to mark a piece off in half-inches and tell a child to put as many stitches as fingers upon its hand. Anything that appeals to his observation without over taxing eyes and strength should be tried to get the hemming right.

Black cotton should be used at first, but not continued for more than a few weeks; it is not nice to use nor good for the eyes, *green* is preferable and might be substituted.

The hem should not be too narrow for young children or it will coil up under the little thumbs. One third inch is to be given when the black or green is used; afterwards this width can give place to one quarter inch.

As the first 8-inch strips cannot be utilized for garments of any kind they may be given to the Infants for slate rubbers; thus the very first work may be made useful.

In working Drill 7, be careful to make use of the third and fourth work fingers in guiding the cotton aright. It is my earnest hope that those who use these papers will quite avoid the rock upon which so many founder, namely, keeping the cotton in the hand and having it just under the last finger instead of above it and its companion, the cleanliness depends upon this, and the manual dexterity is much greater too.

The Hemming, Seaming and Stitching Drills will be found in next month's paper, also a sheet showing the calicoes to which I have referred.

(To be continued.)

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Science Notes.

Most interesting experiments have recently been made with a new coal-getting machine, which is the invention of Mr. T. C. Roberts-Horsefield. It is claimed for this invention that it directly tends to save life inasmuch as it saves the necessity of blasting. It is in fact a powerful hydraulic machine which by forcing a longitudinal plate into the coal brings it down in bulk. Holes are drilled as in the blasting process. The machine is then applied at the top. Two men work the pumps and in a short time a huge mass of over twenty tons is thrown down. There is no *slack* and very little dust. Under the present regulations the blasting can only be carried on at night when the men are out of the pit. If this machine should come into use coal could be worked both night and day. The public generally would rejoice at any new invention which would reduce the perils which miners bravely undergo. Accidents might still happen if blasting were discontinued, as that is only one, though perhaps the most dangerous, of the sources of disaster. Improvements have still to be effected in the safety lamp itself, and what is most important of all, the miners themselves have to learn yet more perfectly that indispensable as courage is, it is often of less value than prudence.

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Dr. Percy Frankland has recently communicated a paper to '*Nature*' containing an interesting account of the advances made in Bacteriology during the last twenty-five years. Pasteur's name will always be associated with the early investigation of these minute forms of life in connection with his researches respecting the so-called spontaneous generation. A great

step forward in the cultivation of Bacteria was the substitution, by Koch, of a solid for a liquid nourishing medium. When living in fluids like broth it becomes difficult to register the rate of multiplication. If, however, a fluid containing organisms be introduced into gelatine-peptone which has been previously melted, they can be evenly distributed through the material, and when it solidifies they are isolated and confined to one spot. Ere long each organism becomes a centre of multiplication and though each of such colonies may consist of thousands of forms yet the spots themselves which indicate the colonies may be taken as representing the number of separate organisms in a definite amount of the original liquid taken. It thus becomes possible to get a pretty accurate notion of the number of these micro-organisms in, say, a teaspoonful of water. Dr. Frankland gives the number of organisms found in two gallons of air during the different months of the year. It will be seen how closely the number is connected with the warmest months of the year. January, 4; March, 26; May, 31; June, 54; July, 63; August, 105; September, 43; October, 35; November, 13; December, 20. The air fully out at sea is free from organisms, and wind, when it has reached the land, is free from germs provided it has come directly across a broad expanse of water. At ordinary elevations the number of germs is sensibly diminished and at great elevations they are entirely absent. They are much more frequent in busy dusty streets than in quiet squares and open parks. Indoors their number depends to a great extent upon the number of persons who are in the rooms. It appears that if water is not frothing or splashing it may contain almost any number of bacteria without communicating them to the air in the vicinity. Hence it was found that the air in sewers was remarkably free from micro-organisms.

All surface waters are found to contain a considerable number of microbes; water from deep wells, especially from the chalk, being on the other hand remarkably free from them.

The point of practical importance, how to keep clear of them, is not easily solved. That many of these forms are quite harmless is almost certain. It is equally probable that others are the source of much human suffering. The knowledge of these lowly forms which is now increasing so rapidly cannot fail to have many far reaching consequences in regard to public health. Some important results have been obtained already. The thorough boiling of milk and any doubtful water renders them safe in nine cases out of ten. Jams and tin meats can be preserved by carefully excluding the air, or reducing the temperature to a point at which these organisms are quiescent. Wounds heal more quickly and easily if kept from contact with the air. These are matters of prime concern; yet they are perhaps only the first fruits of what will follow.

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THE Laboratory erected at Plymouth by the Marine Biological Association of the United Kingdom was opened on Saturday, June 30th, in the presence of a most distinguished company, including many of the most eminent scientific men in the kingdom. It is surprising and not creditable to us to learn that we have lagged behind other nations in the establishment of an institution of this kind. Fishing is a great British industry, a most important source of our food supply. Yet up to the present time there has been no scientific enquiry into the most efficient and economical way of securing the largest and best annual supply of fish. From the general impressions of those who are likely to know there can be no doubt that our present system of fishing is wasteful and haphazard. In these times of close competition when the struggle for existence is so keen, where is there a more promising field for enterprise than in supplying every town in the United Kingdom with plenty of cheap fresh fish. Any movement whether commercial or scientific which gives impulse to this undertaking is worthy of the approval and support of the English people.

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ON Monday the 8th of July the air in the channel became so rarefied that objects could be seen with extraordinary distinctness at a distance of between thirty and forty miles from Dover and Folkestone. The *Times* says that the lighthouse at Cape Grésnez, Calais, and the dome of the Cathedral, and Napoleon's Column at Boulogne, could be distinctly seen with the naked eye, and every prominent object could be picked out along the French coast. The distance from Dover to Boulogne as the crow flies is 28 miles, and the column is about two miles further inland.

How to Teach School Children to Sing from Notes.

BY W. G. MCNAUGHT,

Associate of The Royal Academy of Music.

DIVISION II.

Ear Exercises—continued.

62. Besides practising the imitation exercises described above, easy naming exercises should be given at every lesson. Tests in naming by ear are not required in the examination of this Division, but unless the practice is begun early, and the habit of observation established side by side with the singing from notes or names, the difficulties of the higher Divisions will be much increased.

63. The general experience of school teachers is that note naming by ear is a very difficult subject to teach. To a certain extent this difficulty is undoubtedly inherent, for the best teachers and the sharpest pupils find it easier to sing given passages at sight than to tell them (*i.e.*, name the notes) by ear. But allowing for this, it must also be said that the inability of a large number of school teachers to successfully teach 'telling by ear' is owing to two closely connected and to some extent removable causes, viz., 1st, the teacher's want of fluency in giving exercises; and 2nd in consequence of the natural diffidence arising from this deficiency an extremely unsystematic treatment of the subject.

64. The teacher's difficulty is that he cannot readily invent a great variety of exercises, and fluently sing them off to *laa*. He may *wish* and design to sing, say s l f, but in the act of laaing he finds himself singing something quite different. Conscious of this failing many teachers fall back upon the fatal plan of committing a few easy phrases to memory, and of giving them as tests to their pupils on every occasion. The obvious course for a teacher is to find every possible opportunity for the practice of vocalising (*i.e.*, singing to *laa*) at sight. Ear exercises can certainly never have a fair chance until the teacher can sing to *laa* with the greatest facility. It is altogether unfair to blame the pupils for a teacher's deficiencies in this respect.

65. It will be seen from the above how intimately the practice of laaing is associated with success in telling by ear. Inasmuch as a pupil in telling has to find the proper name of a tone disguised under the name *laa* the advantage of singing all tones to this syllable is easily understood. A good lesson should always include some practice in laaing at sight, or at least the laaing of passages that have been sol-faad once or twice. A systematic course of laaing will be described in dealing with the requirements of Division III.

66. It will be enough here to say that vocalising exercises should follow the course already laid down for teaching the scale. That is, the *doh* chord should be mastered first, and the other tones in the easiest position. As vocalising unknown music imposes a strain upon the attention, it should not be practised for more than a few minutes at a time, or when a class is physically and mentally fatigued.

67. The exercises should be practised in slow time, and the pupils besought to think of a tone before they strike it. If all the pupils of a large class vocalise a new exercise simultaneously there is danger that many will sing without thought, and acquire practically nothing. One of the most valuable principles of class management, viz., the utilisation of the competitive instinct, can be applied with effect in this case. Dividing the class into sections, one section can be pitted against another to vocalise what the other sol-faas. Further remarks upon vocalising will be made when Division III. is dealt with.

68. The practice thus indicated will be useful to the teacher as well as to the pupil. A course of easy and systematic ear telling should be founded upon these vocalising exercises. One of the easiest exercises is to get likenesses and unlikenesses clearly distinguished. Thus the teacher sings to *laa*

d m s

asking the class to notice the effect. Then he promises to sing again either the same thing or something different, the class to say what they think. The teacher should then sing four or five times over the same phrase, and finally he should alter it to say d s m. If the difference is felt, the next step will be to get the class to tell whether d m s or d s m is sung, then s m d or s d m, then m s d or m d s. Next the upper doh^1 should be added and all the variations beginning on doh, viz.

d m s d^1	d s d^1 m
d m d^1 s	d d^1 m s
d s m d	d d^1 s m

distinguished, the class being told the first tone. The variations beginning from *soh* and *me*, and *doh*^{1} should follow

s m d d^1	m s d d^1	d^1 m s d
s m d^1 d	m s d^1 d	d^1 m d s
s d^1 m d	m d s d^1	d^1 s m d
s d^1 d m	m d d^1 s	d^1 s d m
s d d^1 m	m d^1 s d	d^1 d m s
s d m d^1	m d^1 d s	d^1 d s m

and gradually as the skill of the pupils increases they should be made to discover the initial note. Similar exercises should now be given with the range s to s$_1$.

s$_1$ m d s	s$_1$ s d m		
s$_1$ s m d	s$_1$ d s m		
s$_1$ m s d	s$_1$ d m s	etc., etc.	

If these exercises are persistently and carefully applied a foundation of ear telling power will be laid that will materially lighten the labours of higher standards.

69. The song requirement of this Division is as follows :—

'To sing in unison, in good time and tune and sweetly, a school song set to words. Five songs to be prepared.'

70. To sing a song in tune and sweetly implies a certain special attention to voice delivery. As a rule it is difficult in a school course to find time for voice exercises. It is, however, possible to get some very good results and certainly to avoid some very bad results by devoting a short time weekly to special voice exercises. The faults to be avoided are tendencies to shout, to sing feebly, flat, harshly, or with a nasal twang. The aim must be to get sweet, pure, full tune delivered without strain. The teacher must take care that he has control over his own voice and can give a pattern in a fairly pleasant tone and in good tune.

71. Improper or inadequate breathing is at the root of many faults of voice delivery. Children are apt to take too little breath, and they can seldom at first control the emission of breath. To meet this difficulty the class, standing in an upright but easy position, should be practised in holding the breath from four to six seconds, and then should try to hold a note of medium pitch (F or G) with a soft, clear quality of tone for about the same time. Then the doh chord should be sung to the syllables *koo*, *kaa*, and *laa* in the same soft tone, breathing at †

			⊙	†			⊙
d	m	s	d^1	d^1	s	m	d
koo	koo	koo	koo	} The same			
kaa	kaa	kaa	kaa				
laa	laa	laa	laa				

For treble voices this exercise may be sung in Keys D and E, and later on in Key F. Altos should omit the d^1. When such an exercise can be sung as described it should be practised with slurs ; that is, thus :—

			⊙					
d	m	s	d^1	d^1	s	m	d	
Koo	— oo	— oo	— oo	Koo	— oo	— oo	— oo	etc.

care being taken to avoid sliding.

72. Young children should not be expected to learn their songs from a book. A song is made of little phrases, the notes in each of which should be connected without break : these little phrases can be felt in reading at sight only by a fairly advanced class. With young children it is far better to teach songs by pattern. If this is done intelligently, songs are pleasantly and quickly learned and there is less chance of errors creeping in that are difficult to root out.

73. The plan of teaching songs by pattern is to first sing the song right through, to words if possible, in order to interest the class, and then to pattern, bit by bit, on the modulator. Take the following song as an example :—

'Where's the old grey goose.?'

1	2	3	4
| d . r : m . f |	s . s : s . s |	l . f : d^1 . l |	s : — |
5	6	7	8
| l . f : d^1 . l |	s : — |	s . f : f . f |	f . m : m . m |
9	10	11	12
| m . r : r . m |	d . m : s |	s . f : f . f |	f . m : m . m |
13			
| m . r : r . m |	d : — |		

From * 'Songs and tunes.' 1st Course.

The figures divide the song into thirteen fragments. Each fragment should be patterned while the teacher points on the modulator, and then imitated by the pupils, the teacher again pointing. When the fragments can be singly performed with ease, the song can be patterned in say six or seven phrases, and finally it should be sung complete from the modulator.

* Price 3d. J. Curwen and Sons, Warwick Lane.

74. If the song is to be sung from books and the class is made up of children not quick in ordinary reading it will be well to pattern the song again, bit by bit, the children imitating from the book. In doing this the teacher should draw attention to the time values of the notes and show how the song combines the time and tune that have been taught.

(To be continued.)

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How my School was Examined.

BY A

HEAD TEACHER.

INFANTS' DEPARTMENT.

SIX YEAR OLD CHILDREN.

As a *Reading* exercise these children were required to read a few sentences, or short passage from 'The Little Reader' No. II.

Writing and Dictation.—The children had to write their names, then to copy the word '*House*' from a blackboard, and to write from dictation the words:—*Pen, Book, Bee, Ink, Paper,* and *Day.*

In *Arithmetic* the following tests were given:—2 + 5 + 4 + 1 = 12; 6 + 12 + 14 = 32; 12 − 3 = 9; 19 − 11 = 8. These were done on slates. The Inspector also asked such questions in Mental Arithmetic as 2 + 8 + 1; 3 + 6 + 4; 8 − 2. How many farthings in a half-penny? In a penny? In two-pence? I had 20 oranges and gave away 12; how many were left? 7 and 4 and 3; 8 and 5 and 1 and 4.

For *Sewing* and *Knitting*, the children were divided into two groups. In each group boys and girls were mixed. The first group had to do a piece of plain hemming in blue. The second group had knitting.

FIVE YEAR OLD CHILDREN.

The *Reading* was examined from Moffatt's 'Infant Readers.'

Spelling consisted of such words as *Cow, Boy, Girl, Leg, Man,* and *Ball.*

As a *Writing* exercise the children had to copy the word '*House*' from the blackboard.

In *Arithmetic*, the Teacher questioned the class on the ball-frame.

Sewing.—The children were set to do 'picking.'

BABIES' CLASS.

This class *wrote* on slates from memory the letters *a, h, m, o, b,* and a few figures; *read* the letters, capital and small, from Alphabet Card, and a Reading Sheet; and then the children were set to thread needles.

Object Lessons.—The Inspector questioned the children on the *Elephant*, on *Colour*, on *Time*, and on the *Bell.* The Master of the School asked questions on *Glass*, on a *Pin*, and on *Milk.*

The *Singing* was taught from note, and the Inspector tested from the Modulator, and sang some short passages for the children to imitate. The *Songs* sung were 'The Doll's Party,' and 'Now we Little Children assembled in School.'

The children recited two little pieces—'Welcome Little Robin,' and 'The Two Little Kittens.'

UPPER DEPARTMENT.

STANDARD I.

Arithmetic.—(1) 754 + 16 + 830 + 13 + 9; (2) 909 − 236; (3) 101 − 23.

Answers:—(1) 1,622; (2) 673; (3) 78.

Writing and Dictation:—A few lines of transcription from the Reading Book; and the following words from dictation:—*Money, Spend, Milk, White, Friend, Paper.*

Geography—The questions were mostly on the Plan of the School, and the Points of the Compass.

STANDARD II.

Arithmetic:—Two sets of sums were given:—

A. (1) Add 7,936; 847; 58; 699; and 83,899.
(2) 175,002 − 9,148.
(3) 76,807 × 754.
(4) 801,004 ÷ 7.

B. (1) 95,387 × 1,068.
(2) Add 79,368; 874; 8,376; 789; and 19.
(3) Take 75,479 from half a Million.
(4) 769,003 ÷ 11.

Answers.—*A.* (1) 93,439. (2) 165,854. (3) 57,912,478. (4) 114,429 + 1.

B. (1) 101,873,316. (2) 89,426. (3) 424,521. (4) 69,909 + 4.

Dictation.—The exercise consisted of six lines from one of the reading books.

Geography.—The Inspector questioned mostly on Mountain, River, Plateau, and Table-land; and the Master asked questions on the shape of the Earth, the Axis, Poles, Rotation and Revolution.

STANDARD III.

Arithmetic.—The following are two of the sets of sums given:—

A. (1) Add together £79,365 11s. 8½d., £73 14s. 9d., £18 18s. 6½d., £799 18s. 4½d., £135 9s. 10½d., £73,469 18s. 7¾d.

(2) Take £296 19s. 11¾d. from five hundred pounds.

(3) Divide 806,297 by 384.

(4) A man having £205, bought a horse for £37 10s. 6d., and, after paying for a carriage, found he had 17s. 6d. left. Find the cost of the carriage.

B. (1) Add £349 14s. 7¼d., £634 17s. 3d., £76 13s. 7¾d., £908 11s. 10d., £3 9s. 9½d.

(2) Divide 7,609,351 by 771.

(3) From £50,041 1s. 1¼d. take £9,892 19s. 4d.

(4) If 3,775 letters pass through a Post Office in a day, how many letters pass through it in a year?

Answers.—*A.* (1) £153,863 11s. 10¾d. (2) £303 0s. 0¼d. (3) 2,099 + 281. (4) £166 12s.

B. (1) £1973 7s. 1½d. (2) 9869 + 352. (3) £40,148 1s. 9¼d. (4) 1,377,875.

Geography.—The Inspector questioned especially on the occupations of the people in various parts of the Country, as, for example:—What do the people do in Cornwall? In the North of England? In Wales? In the Channel Islands? and so on.

STANDARD IV.

Arithmetic.—The following is a specimen test:—

(1) Multiply £7,285 7s. 4½d. by 217.

(2) Divide £87,571 5s. 4¾d. by 91.

(3) Reduce 276,829 inches to miles.

(4) I earn 50s. a week; how much more must I earn per week to have £197 12s. per year?

Answers.—(1) £1,580,924 15s. 10½d. (2) £962 6s. 5d. + 71f. (3) 4 mls. 2 fur. 38 pls. 0 yds. 2 ft. 1 in. (4) £1 6s.

Grammar.—What is a Personal Pronoun? A Relative Pronoun? An Interrogative Pronoun? What is the possessive of *me*? Of *thee*? Of *he*? What is the objective of *she*? Of *I*? Of *thou*? etc.

Parse.—'The skipper he stood beside the helm,
His pipe was in his mouth.'

Geography.—In this Standard also the questions were mostly on the occupations of the people in different parts of the British Empire, as:—What do the people do in the North of Ireland? In Victoria? In Canada? In New Zealand? In New South Wales? and so on.

Music:—The following tests were given in Division II.

Modulator.—**d' d s m d' m f m s d' t d' s l s d.**

Time Test.—| 1 :1 | 1 :— | 1 :1 | 1 :1 | 1 :— | 1 :— ||

Ear Tests.—**s l s d; d' s l s; d' d l s.**

In Divisions III. and IV.

Modulator.—**m f s fe s m s l t d' ta l s l t d' m' d'.**

Time Tests.—(1) | 1 :1.1 | 1 :— | 1 : ||

(2) | 1 :— :— | 1 :1 : | 1 :— :— | 1 :— :1 ||

Ear Tests.—**d m s fe s; s m d' t; s s l s l t d'.**

Songs.—'How Beautiful upon the Mountains.'
'Down where the Bluebells grow.'
'The Mighty Norseman.'

In order to make this paper more complete and useful we add some questions for the upper Standards given in another school.

STANDARD V.

Arithmetic.—A Card.—(1) 7,730 at £1 7s. 9d. each.

(2) Add ¾ and ⅛, and take $\frac{3}{10}$ from the sum.

(3) The rent of 230 acres 3 rds. 35 pls. is £307 19s. 2d. Find the rent of 92 acres 1 rd. 22 pls.

(4) Bought 5¾ tons of hay for £20 2s. 6d., and sold it at 4s. per cwt. Find the gain.

Answers.—(1) £10,725 7s. 6d. (2) $\frac{25}{40}$. (3) £123 3s. 8d. (4) £2 17s. 6d.

Composition.—The Inspector read a short story about a mischievous parrot which the children had to reproduce.

STANDARD VI.

Arithmetic.—A Card:—(1) What must be added to $3\frac{5}{9}$ to make $5\frac{1}{18}$?

(2) How many half-pence are left after taking ·0125 of a sovereign from ·25 of a half-crown?

(3) Find simple interest on £150 for 219 days at 4 per cent.

(4) What is the value of x in the proportion $2\frac{1}{3} : 3\frac{1}{4} :: x : 5\frac{1}{8}$.

Answers.—(1) $2\frac{1}{17}$. (2) 9. (3) £3 12s. 0d. (4) $3\frac{83}{117}$.

Composition.—Write an account of a Month's Holiday in the Mediterranean Sea; or of a pleasant Excursion to the Sea-side; or an essay on London Costermongers.

Grammar.—Searching questions were asked on the theory of analysis; and the following sentence from the passage for repetition was parsed and analysed orally:—

'I that denied thee gold will give my heart.'

Geography for upper Standards was examined by means of a blank map of Europe.

STANDARD VII.

Arithmetic.—A Card:—

(1) The keep of 35 horses costs £10 9s. 6d. per week. Find the cost of 56 horses from May 1st to June 11th, both inclusive.

(2) I mix 3 lbs. of tea at 2s. 4d. a lb., 9 lbs. @ 2s. 6d., 6 lbs. @ 4s. 9½d., 3¾ lbs. @ 5s. What is the price of the mixture per lb.?

(3) If Insurance is $\frac{3}{8}$ per cent., find the amount on £3,020.

(4) In an army 8 per cent. die, and 14 per cent. are killed, and there are left 1,638 men. How many were there at first?

Answers.—(1) £100 11s. 2⅔d. (2) 3s. $5\frac{3}{19}$d. (3) £11 4s. (4) 2,100 men.

Drill was inspected, and the following course was pursued:—First the boys were sized, then formed into company, and then such commands were given as 'Form fours deep,' 'Fours right,' 'Fours left,' 'Form cavalry square, on the left,' 'Reform two deep,' 'Dismiss.'

—o—

Oral Teaching: The Preparation of Lessons and of Notes of Lessons.

BY JOSEPH H. COWHAM, F.G.S.,
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CHAPTER III.

The Preparation of a Lesson.

Illustrations, what they are and how to use them.—Oral teaching possesses the great advantage over self instruction by reading and by task work, that at every point of the lesson where difficulty presents itself the teacher is present to place the matter in a new light or to supply additional material; in fact it is in the skill the teacher manifests in recognizing and in clearing up these difficulties that the value of oral teaching mainly rests.

In the effort to assist the scholar to acquire new knowledge the teacher resorts very largely to illustrations. These may be—

1. **Verbal,** in which the teacher refers to something which is already in the minds of the children, and which is readily recalled in answer to his statements.

2. **Pictorial**, by which either a complete representation of the object under discussion is exhibited, or a diagram is drawn showing distinctly the portions of the figure in which most difficulty presents itself.

3. **Objects, Models, Apparatus**, which are capable of being brought under the immediate observation of the class.

Before taking the three forms of illustration named above in detail, it may be well to note that whatever form of illustration is adopted it should be familiar; that an illustration which itself requires explanation is faulty.

A student was recently teaching a first lesson to Standard III. on the County of Middlesex. He began by referring to the size of London. He sought to impress this by a description of the small country town from which he had recently come, and by contrasting it with the size of London. Now whilst this was an illustration admirably suited to the thought of the student and most helpful to him in his efforts to realize the immense size of London, it did not assist the London boy in the least. The student was advised to take some area well known to all the scholars in the class; to show this area on a sketch map and make a comparison between it and the wider area covered by London; and thus to encourage the children to estimate by careful measurement the size of London, and the time required to walk across or to travel round it. In this way the children, instead of starting with an illustration which is unfamiliar and which leaves them in a hazy and doubtful condition of knowledge, begin with what is known, and by a process of comparison and contrast arrive at some sound and serviceable knowledge of the town in which they live.

Verbal Illustrations.—That which we understand by the term verbal illustration may be best seen in the following contrast between the method of **telling** and that of **training**.

Example 1. Suppose the word 'carnivorous' occurs in a reading lesson: I may explain it by simply stating to the class that 'all animals which prey upon other animals are termed carnivorous,' or more briefly still that the word means 'flesh-eating.' This is the *telling* method. I may, however, proceed by illustrating the use of the term by contrasting the food of the horse and that of the lion; that of the tiger and the cow, and that of the wolf and the rabbit; then I may lead the children to group the animals named into two classes, viz., those which eat flesh and those which do not; then apply the term 'carnivorous' to the class containing the flesh-eating animals, and finally ask the class to define the term. This latter is the *training* method.

Example 2. In a **Grammar Lesson** I may tell the class that 'a pronoun is a word used instead of a noun, to prevent the too frequent recurrence of the noun in discourse.' I may, however, lead the children to the same truth by the following process:—

(a) Examples supplied by the Teacher:

1. John wrote beautifully and John gained a prize.
2. Jane ran to school, but Jane was late.
3. The bee flies from flower to flower and the bee gathers honey.

(b) Corrections made by the Class:

1. John wrote beautifully and **he** gained a prize.
2. Jane ran to school but **she** was late.
3. The bee flies from flower to flower and **it** gathers honey.

(c) Children to make similar examples to Group (a) and correct them as in Group (b).

(d) Collect the results of the teaching above:

1. That there is an awkward repetition of the noun in the first group of sentences. (*Children led by teacher to state this.*)
2. That this is avoided in the second group by using another word in place of the second noun. (*By children and teacher.*)
3. The word used in place of the noun is called a pronoun. (*Told by the teacher.*)
4. Definition of pronoun. (*Told by the children.*)

Example 3. In a **History Lesson** I may wish to teach that 'William the Conqueror was a powerful monarch.' The simple statement will convey a vague notion of the truth, and this may or may not remain—a mere skeleton of knowledge—in the child's mind. If, however, I relate the story of Senlac, the power and bravery of William as a soldier become evident; his development of the feudal system illustrates his power of statesmanship; his treatment of his brother Odo and his son Robert is evidence of the strength of his will. Thus, by a careful examination of three striking features of William's reign, the children may be led to a much more complete and full notion of the term 'powerful' as applied to William the Conqueror.

In each of the above cases the *telling* method proceeds by the short way of definition and direct statement, whilst the *training* method in each case is based upon a collection of examples and illustrations. Children are required to take the examples and illustrations supplied, and by way of comparison and contrast to discover truth for themselves, and through the effort to get that training in processes of thought which in after life will be vastly more valuable than whole stores of fragmentary facts and statements.

Pictorial Illustrations—Pictures and Diagrams.

A good supply of pictures is valuable not only for the brightness they impart to the schoolroom, and the interest they awaken in the minds of the children, but also because they form the quickest mode of conveying correct and reliable information about distant objects and places. The pictorial illustrations which are most effective for the purposes of oral teaching are not those which usually decorate our school walls. Maps, illustrations of various forms of natural history, scenes from nature, historical events, mechanical powers, industries, trades, &c.—these have their place, and often yield valuable information when other means of teaching are not available, as, for instance, during periods of relaxation from school lessons. The pictorial illustrations, however, most effective for teaching purposes are those which the teacher draws during the progress of his lesson. These sketches are valuable for the following among other reasons:—

1. The object can be drawn to any scale.
2. Any portion of the drawing of special interest and importance can be still further enlarged, and thus more clearly impressed, *e.g.*, the structure of the eye or the foot of an animal, a selected district in geography, an operation in science.
3. Unimportant details may be omitted, and thus the attention of the scholars will be concentrated upon the most essential features.
4. The drawing may be developed as the lesson proceeds.
5. By means of coloured chalks confusion between different portions of the drawing may be avoided.
6. Thorough preparation on the part of the teacher is ensured.
7. When copied by the class it forms a concise record available for entry in their note books, and at the same time is a training for children to embody their notions in graphic form.

Should the teacher find it necessary to prepare completed sketches before beginning his lesson, it is best to cover the portion of the drawing not required during the early stages of the lesson with paper held by drawing pins, and uncover each portion of his drawing as it is required. Children are close investigators of pictures, and when the entire drawing is shown at first, the teacher finds for a time the attention of his class difficult to direct; and the gradual unfolding of his drawing has the further advantage of maintaining the spirit of expectancy in his class throughout the lesson.

Object Illustrations.—Objects, Models, Home-made Appliances, &c.:—

It has already been stated (Chapter I.) that all, or some of these, may be brought with the greatest advantage into almost every lesson. With their introduction an awakened interest is at once manifest throughout the entire class. Unusual efforts are put forth by even its dullest members to see and handle the new object. When the class is questioned upon what is remembered it will be found that whilst very much that was verbally communicated is forgotten, the information gained by a personal inspection of objects remains, and is the first to be reproduced. Over and beyond the help to acquisition and retention which a display of objects and models affords, there are distinct educational advantages which no other form of teaching secures so fully and readily. There is the close and well-directed observation, by which first hand knowledge, both full and accurate, is obtained; the classification of the facts observed is conducted under the most favourable conditions, for whilst the effort is easy the results are sound and lasting; the inspection of the gradual production of the finished article through a series of manufacturing stages, and the observation of the sequence of effects obtained during the progressive stages of an experiment, these form an admirable preparation for the study of the more subtle and complex operations in nature and in science; and throughout the entire exercise there is induced a concentrated state of mind, which through repeated effort tends to become habitual, and which, when formed, will be of immense service in other branches of school study, and in every effort of life.

Objects should be collected as far as possible through the scholars and their friends. Local industries and the natural products of the surrounding district should be very fully represented. All these should be labelled and arranged in a school cabinet. Any objects mentioned in the text of the reading books, not already in the cabinet, should be obtained and be ready for exhibition when the lesson in which it is mentioned is taken. The natural products of the area selected for the geography lessons of the year form other objects of great service, and to these may be added the manufactures of the district, showing as far as possible the stages of the industry, from the raw material to the finished article. The specific subject, especially if a science be taken, will demand the collection of material and the making of apparatus.

Models, Home made Appliances, &c.—These are often found to be far more effective teaching material than the more elaborate and highly finished article which may be purchased. As a sample of many which have been made and found successful, the following may be mentioned:—

1. Models of countries, counties, river basins, &c., in sand and in plaster.
2. The phases of the moon, illustrated by eight painted balls, each mounted on the straightened wire of a bill file.
3. The eclipses of both sun and moon, illustrated by taking a piece of stiff cardboard to represent the plane of the ecliptic, with four discs of cardboard to represent the moon's orbit, and intersecting the first plane at an angle of 5°, and with the line of intersection (line of nodes) constant in direction.
4. A collar box with a circular disc poised on a peg and carrying beneath it a magnetised bar of steel. This will illustrate the construction and action of a mariner's compass.
5. A bar of soap is readily carved into the model of a bone, and, with the addition of powder obtained from coloured chalks, the structure of a section of bone is easily and almost perfectly imitated.
6. The action of water in springs may be illustrated by taking a small box having a glass side, and by arranging clay and gravel in alternate and inclined layers. The water when poured on the top of the layers will run along the gravel bed between the layers of clay, and may be collected as at a spring, if holes be made the end of the box into the gravel.
7. Boys have made for themselves kaleidoscopes, cameras, magic lanterns, the puzzle of looking through a brick, &c., thus applying the most important laws of reflection and refraction of light in the most instructive manner.

The above are examples of very many appliances which teachers and scholars may devise for the interesting and intelligent teaching of the class and specific subjects. Children especially are delighted when an object which they themselves have constructed is counted worthy of a place in the school museum.

PLAN OF A WRITING LESSON.

STANDARD I.

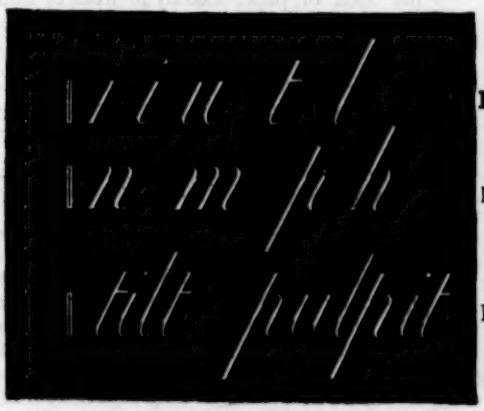
A. Preparation for Lesson.

1. Arrange the class, an equal number in each desk, and cause each pupil to cover from the front row.
2. Distribute writing material, pens and books, or sheets ruled with horizontal and oblique lines (Mulhauser's rhomboids), as shown on the sketch below.

   A writing monitor should be appointed whose duty it is to place at the end of each desk a supply of books and pens. These, at the word of command, are to be passed in an orderly manner to each scholar.
3. The teacher should decide the amount of matter necessary for one lesson, and should further determine the special points in writing he intends to teach.

   In this lesson the exact form of the right line /, the lower curve called the link ∫, and the upper curve called the hook ʔ, are to be taught.

B. Matter of the Lesson.



The above sketch presents simple matter, sufficient for one lesson; it is divided into three parts as follows:—

i. The first line consisting of letters made up of the right line and link.

ii. The second line containing letters introducing the hook in addition to the forms taught in the first line.

iii. Words made up of letters taken from lines i. and ii.

C. Oral Teaching.

Before the class begin to write attention should be drawn to the mode of writing the first line.

(*a*) Write the line on the black-board under the observation of the class.

(*b*) Show the scholars that the right line is perfectly straight and is the same thickness from top to bottom.

This may be further impressed by making an irregular stroke ∫ and by asking the class to state wherein it is faulty.

(*c*) The lower curve (link) is exactly the same shape in every letter on the sketch. The common faults are:—(1) The curve is made too pointed or too flat / l. (2) The up stroke is made too straight, so that if continued it would cut through the following down stroke. Show these errors by examples, and allow the class to detect and correct them.

N.B.—The same method of oral teaching may be continued with lines i. and ii. after the preceding line or lines have been satisfactorily taught.

D. Class exercise in Writing.

Before allowing the class to write, arrange each scholar in the exact position you wish him to occupy, and start the writing exercise by means of the following signals:—

'**One.**'—Each pupil at this signal should place his book or paper exactly in front of him, with the top and bottom edges of his paper parallel to the edge of the desk.

'**Two**'—The scholars turn the left side to the desk and place the left arm upon it; the left hand to rest upon, and steady the paper.

'**Three.**'—Take up the pen and hold it out slightly in front.

The teacher seated at a table may do each of these movements for the imitation of the class, and should be especially on the alert at this stage in order to detect any pen held awkwardly. The steadiness or otherwise of his class at this point will be a fair indication of the kind of writing he may expect from his class. Unless these operations are performed in perfect order the writing which follows will be sure to suffer.

'**Four.**'—The children now dip the pen and proceed to write the first line twice.

E. Supervision of the Class.

The teacher must stimulate every member of his class during the writing effort. A careless stroke will spoil the copy. The children should be made to understand that every fresh line attempted must be an improvement upon the last. In order to do this:—

1. Move quickly round the entire class, pausing chiefly where careless writing is known to be probable.

2. Any observations the teacher directs to individuals may be in sufficiently loud a tone of voice to be heard by the entire class.

3. Whilst no fault is passed over without correction (by pencil) it is well to commend efforts on the part of any scholars which are very successful.

It is not well to praise frequently individuals by name; their work, however, may be commended in order to stimulate the remainder of the class to improved effort.

F. Correction of Faults.

Whilst individual faults are best corrected during the supervision stage, there will be certain common errors sufficiently marked to allow of class correction. In order to do this effectively:—

1. Use a black-board ruled as indicated in the sketch above.

2. Write the common errors in an exaggerated form, and allow the pupils to recognise and state them.

3. Write the corrected letter on the board as a model for the class.

4. When two or three common errors (not more) have been thus corrected the class should be encouraged to write one more line—the last and best—before proceeding to the next line of writing matter.

G. Close of the Lesson.

After each of the three parts of the lesson has been dealt with in the manner described above, the lesson may be closed by affixing a mark as an estimate of the value of the work done by each scholar. This is advisable with junior classes, but with older children other and higher incentives to excellent work may be applied. After the general review of the writing of the class the materials must be passed to the end of each desk for orderly disposal by the monitor.

—o—

Query Column.

RULES.

1. Each correspondent is restricted to *one question*. We should be much obliged if correspondents, who send questions for solution, would give (if possible) the required answer, and the source from which the question is obtained.

2. No query can be answered unless accompanied by the real name and address of the sender, not necessarily for publication, but as a guarantee of good faith and for facility of reference.

3. ☞ When a pseudonym is adopted it should be written at the end of the query, and the real name and address on a separate piece of paper.

4. Correspondents are requested to write their queries *legibly*, and on one side of the paper only.

5. Replies will not be sent through the post.

6. Queries must reach the office *not later than the 12th of the month*, or they cannot be attended to in the following issue.

*** All communications for this column should be addressed—'*The Query Editor*,' *The Practical Teacher, Pilgrim Street, Ludgate Hill, London, E.C.*

Algebra.

1. QUADRATIC.—Solve :—

$$\left.\begin{aligned}[(1+x)^2+y^2]^{\frac{1}{2}}+[(1-x)^2+y^2]^{\frac{1}{2}}&=4\\(4-x^2)^2&=18-4y^2\end{aligned}\right\}.$$

$$(1)\ [(1+x)^2+y^2]^{\frac{1}{2}}+[(1-x)^2+y^2]^{\frac{1}{2}}=4$$

$$[(1+x)^2+y^2]^{\frac{1}{2}}=4-[(1-x)^2+y^2]^{\frac{1}{2}}$$

Squaring] $(1+x)^2+y^2=16-8[(1-x)^2+y^2]^{\frac{1}{2}}+(1-x)^2+y^2$

$$8[(1-x)^2+y^2]^{\frac{1}{2}}=16+(1-x)^2-(1+x)^2$$
$$=16+1-2x+x^2-1-2x-x^2$$
$$=16-4x$$
$$2[(1-x)^2+y^2]^{\frac{1}{2}}=4-x$$
$$4[(1-x)^2+y^2]=16-8x+x^2$$
$$4(1-2x+x^2)+4y^2=16-8x+x^2$$
$$4-8x+4x^2+4y^2=16-8x+x^2$$
$$4y^2=12-3x^2.$$

$$(2)\ (4-x^2)^2=18-4y^2$$
$$16-8x^2+x^4=18-(12-3x^2)$$
$$=18-12+3x^2$$
$$=6+3x^2$$
$$x^4-11x^2=-10$$
$$x^4-11x^2+(\tfrac{11}{2})^2=-10+\tfrac{121}{4}$$
$$=\tfrac{81}{4}$$
$$x^2-\tfrac{11}{2}=\pm\tfrac{9}{2}$$
$$x^2=\pm\tfrac{9}{2}+\tfrac{11}{2}$$
$$=10,\text{ or }1$$
$$\therefore x=\pm 1,\text{ or }\pm\sqrt{10}.$$
$$4y^2=12-3x^2$$
$$=12-3,\text{ or }12-30$$
$$=9,\text{ or }-18$$
$$2y=\pm 3,\text{ or }\pm 3\sqrt{-2}$$
$$\therefore y=\pm\tfrac{3}{2},\text{ or }\pm 3(-\tfrac{1}{2})^{\frac{1}{2}}.$$

Notes.—(1) You copied your query incorrectly both times, as you placed the 4 from the first equation as belonging to the second equation also, instead of having a comma between the two equations. This carelessness caused a great deal of unnecessary labour.

(2) If in future you send a query, please enclose it in an *envelope*, otherwise it will not receive attention.

2. A MATHEMATICIAN.—If p rays are drawn through one point in a plane, and q rays through another point, no two of the rays being parallel, and if all the points of intersection are joined two and two by straight lines, find the number of lines.

No. of points of intersection $= pq$;

$\therefore$ No. of straight lines $= \frac{1}{2}pq(pq-1)$.

3. ELEVE.—If the nth term of an A.P. is $\frac{3n-1}{6}$, and S $= \frac{n}{12}(3n+1)$, find the series.

$$\left.\begin{aligned}(1)\ a+(n-1)d&=\frac{3n-1}{6}\\(2)\ \frac{n}{2}\left\{2a+(n-1)d\right\}&=\frac{n}{12}(3n+1)\end{aligned}\right\}$$

From (2),

$$2a+(n-1)d=\tfrac{1}{6}(3n+1)$$
$$a+(n-1)d=\tfrac{1}{6}(3n-1)\quad(1)$$
$$\therefore a=\tfrac{1}{6}\text{ of }2$$
$$=\tfrac{1}{3}.$$
$$a+(n-1)d=\frac{3n-1}{6}$$
$$(n-1)d=\frac{3n-1}{6}-\tfrac{1}{3}$$
$$=\frac{3n-3}{6}$$
$$=\frac{n-1}{2}$$
$$\therefore d=\tfrac{1}{2}.$$
$$\therefore \text{Series}=\tfrac{1}{3},\ \tfrac{5}{6},\ \tfrac{4}{3},\ \tfrac{11}{6},\ \&c.$$

The series could have been found more easily thus :—

Let $n=1$,

Then, first term $=\frac{3-1}{6}=\frac{1}{3}$;

Let $n=2$,

Then, second term $=\frac{6-1}{6}=\frac{5}{6}$;

$\therefore$ Difference $=\frac{5}{6}-\frac{1}{3}=\frac{1}{2}$;

$\therefore$ Series $=\frac{1}{3},\ \frac{5}{6},\ \frac{4}{3},$ &c.

Arithmetic.

1. GYMS.—Part of a sum of £3,000 is invested to produce 3½ per cent., and the remainder 4½ per cent. If the interest on the whole for a year amount to £122 9s. 10½d., find the sum invested at each rate.

Interest on £3,000 at 4½ % = £135;

Difference between this interest and the interest received
$= £135-£122\ 9s.\ 10\tfrac{1}{2}d.$
$= £135-£122\tfrac{59}{480}$
$= £12\tfrac{421}{480}$;

Difference between the interest on £1 at 4½ and 3½ % respectively = $£\frac{1}{100}$;

$\therefore$ Sum invested at 3½ % $= £(12\tfrac{421}{480}\div\tfrac{1}{100})$
$= £\tfrac{2521}{4}$
$= £1,250\ 10s.$

Sum invested at 4½ % = £3,000 − £1,250 10s.
= £1,749 10s.

2. A. M.—A farm is let for £96 and the value of a certain number of quarters of wheat. When wheat is 38s. a quarter, the whole rent is 15 per cent. lower than when it is 56s. a quarter. Find the number of quarters of wheat which are paid as part of the rent. (*Barnard Smith.*)

Difference of (56s. − 38s.) or 18s. in the price of wheat makes a difference of 15 per cent. on the whole rent., when wheat is 56s. a quarter;

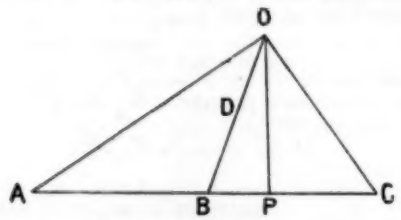
$$\therefore \text{(No. of qrs. } \times 18)\text{s.} = 15 \text{ per cent. of } [£96 + \text{(No. of qrs. } \times 56)\text{s.}]$$
$$= \tfrac{3}{20} \text{ of } £96 + \tfrac{3}{20} \text{ of (No. of qrs. } \times 56)\text{s.}$$
$$= 288\text{s.} + \text{(No. of qrs. } \times 56 \times \tfrac{3}{20})\text{s.}$$
$$= 288\text{s.} + \text{(No. of qrs. } \times \tfrac{42}{5})\text{s.}$$
$$\text{(No. of qrs. } \times 18)\text{s.} - \text{(No. of qrs. } \times \tfrac{42}{5})\text{s.} = 288\text{s.}$$
$$\text{No. of qrs. } \times (18 - \tfrac{42}{5}) = 288$$
$$\text{No. of qrs. } \times \tfrac{48}{5} = 288$$
$$\therefore \text{No. of qrs.} = 288 \times \tfrac{5}{48}.$$
$$= \underline{30}. \text{ Ans.}$$

Trigonometry.

1. WILTSHIRE YOKEL.—A balloon was observed to be due S. and at an elevation of 30° at noon; and its shadow was one mile from the place of observation, the sun's altitude being 45°. At 11 a.m. and 1 p.m. the bearings of the balloon were S.E. by S. and S.W. by W. respectively. Find the velocity and the direction of motion of the balloon, supposing it to move uniformly at a constant height. And show that the nearest distance of the balloon from the place of observation was

$$\frac{\sqrt{3}+1}{4}\sqrt{10+3\sqrt{2}} \text{ miles.}$$

(*Todhunter's* 'Trigonometry for Beginners.')



Let O represent the position of the observer, and let A, B, C, represent the points on the ground which are vertically under the balloon at 11, 12, and 1 o'clock respectively.

Then ABC is a straight line, AB = BC, and OB is the direction due South from O.

The angle BOA = $33\frac{3}{4}°$, and the angle BOC = $56\frac{1}{4}°$.

Therefore the angle AOC is a right angle; and since B is the middle point of AC, it is the centre of a circle which could be described on AC as diameter, and which would pass through O.

Thus BO = BC = BA.

Let h denote the height of the balloon, and D the point on OB where the shadow of the balloon falls at noon.

Then since the altitude of the sun = 45°,

$$BD = h \cot 45° = h;$$
$$OB = h \cot 30° = h\sqrt{3};$$

But OD represents 1 mile;

$$OB = OD + BD$$
$$h\sqrt{3} = 1 + h$$
$$h(\sqrt{3}-1) = 1$$
$$\therefore h = \frac{1}{\sqrt{3}-1}$$
$$= \frac{\sqrt{3}+1}{(\sqrt{3}-1)(\sqrt{3}+1)} = \frac{\sqrt{3}+1}{3-1}$$
$$= \frac{\sqrt{3}+1}{2};$$
$$BC = BO$$
$$= 1 + h$$
$$= 1 + \frac{\sqrt{3}+1}{2}$$
$$= \frac{3+\sqrt{3}}{2}.$$

$\therefore$ The balloon moves at the rate of $\frac{3+\sqrt{3}}{2}$ miles an hour.

The angle BCO = angle BOC = $56\frac{1}{4}°$;

$\therefore$ The angle OBC = $180° - (56\frac{1}{4}° \times 2)$
$= 180° - 112\frac{1}{2}°$
$= 67\frac{1}{2}°$;

$\therefore$ Direction of the balloon is W.N.W.

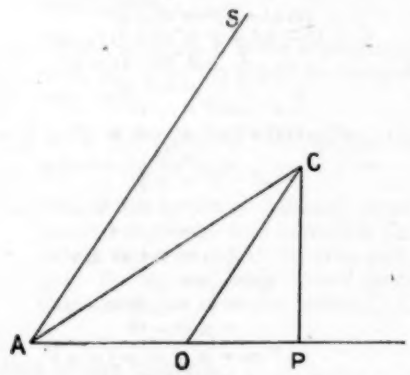
Draw OP perpendicular to AC; then the balloon is nearest to O, when it is vertically over P.

$$\therefore \text{Distance}^2 = h^2 + OP^2$$
$$= h^2 + OB^2 \sin^2 OBC$$
$$= h^2 + OB^2 \sin^2 67\tfrac{1}{2}°$$
$$= h^2 + OB^2 \frac{\sqrt{2}+1}{2\sqrt{2}}$$
$$= \left(\frac{\sqrt{3}+1}{2}\right)^2 + \left(\frac{3+\sqrt{3}}{2}\right)^2 \left(\frac{\sqrt{2}+1}{2\sqrt{2}}\right)$$
$$= \left(\frac{\sqrt{3}+1}{2}\right)^2 + 3\left(\frac{\sqrt{3}+1}{2}\right)^2 \left(\frac{\sqrt{2}+1}{2\sqrt{2}}\right)$$
$$= \left(\frac{\sqrt{3}+1}{2}\right)^2 \left\{1 + \frac{3\sqrt{2}+3}{2\sqrt{2}}\right\}$$
$$= \left(\frac{\sqrt{3}+1}{2}\right)^2 \left\{1 + \frac{6+3\sqrt{2}}{4}\right\}$$
$$= \left(\frac{\sqrt{3}+1}{4}\right)^2 (10+3\sqrt{2})$$

$$\therefore \text{Distance} = \frac{\sqrt{3}+1}{4}\sqrt{10+3\sqrt{2}} \text{ miles.}$$

2. WILTSHIRE YOKEL.—The altitude of a cloud was observed to be α, and that of the sun in the same direction to be β, and the distance of the shadow of the cloud from the station of the observer was found to be c feet; show that the height of the cloud was $\frac{c \sin\alpha \sin\beta}{\sin(\beta-\alpha)}$ feet.

(*Todhunter's* 'Trigonometry for Beginners.')



Let A represent the station of the observer and C the cloud.

Draw AS towards the sun, and through C draw CO parallel to AS, meeting the ground at O.

Then O will be the position of the shadow of the cloud.

This depends on the fact that owing to the distance of the sun the straight lines drawn from the sun to the station and to the cloud may be considered parallel.

Draw CP perpendicular to the line representing the ground.

Then CP represents the height of the balloon.

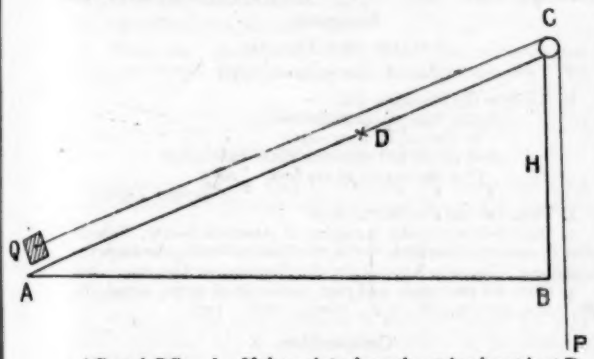
$$\frac{CO}{AO} = \frac{\sin OAC}{\sin OCA}$$
$$= \frac{\sin\alpha}{\sin(COP - OAC)}$$
$$= \frac{\sin\alpha}{\sin(\beta-\alpha)}$$

$$\therefore \text{CO} = \frac{\text{AO} \sin \alpha}{\sin(\beta - \alpha)}$$
$$= \frac{c \sin \alpha}{\sin(\beta - \alpha)}.$$
$$\frac{\text{CP}}{\text{CO}} = \sin \text{COP}$$
$$= \sin \beta$$
$$\therefore \text{CP} = \text{CO} \sin \beta$$
$$= \frac{c \sin \alpha \sin \beta}{\sin(\beta - \alpha)}.$$

$\therefore$ Height of cloud was $\frac{c \sin \alpha \sin \beta}{\sin(\beta - \alpha)}$ feet.

Mechanics.

————.—A descending weight P draws a weight Q up an inclined plane whose height and length are h and l respectively, by a cord passing over a pulley at the summit of the plane. Find where the cord must be cut that the weight Q may just reach the top of the plane.



AC = l, BC = h. If the point where the string is cut is at D, then let AD = x and therefore DC = $l - x$. Q starts from A and acted on by the accelerating force acquires a velocity at D which just carries it on to C. The acceleration is plainly

$$g \frac{\left(\text{P} - \text{Q}\frac{h}{l}\right)}{\text{P} + \text{Q}} \quad \text{or} \quad \frac{\text{P}l - \text{Q}h}{\text{P} + \text{Q}} \cdot \frac{g}{l};$$

Hence $v^2 = 2\frac{g}{l}\left(\frac{\text{P}l - \text{Q}h}{\text{P} + \text{Q}}\right) x$ .....i.

The string is now cut and the velocity v is sufficient to carry Q to the top of the plane against the acceleration $g\frac{h}{l}$.

Hence $v^2 = 2g\frac{h}{l}(l - x)$ .....ii.

From i. and ii. $2g\frac{h}{l}(l - x) = 2\frac{gx}{l}\frac{(\text{P}l - \text{Q}h)}{(\text{P} + \text{Q})}$

$$(l - x) = \frac{(\text{P}l - \text{Q}h)\, x}{(\text{P} + \text{Q})\, h}$$
$$l = x \frac{(\text{P}l - \text{Q}h + \text{P}h + \text{Q}h)}{(\text{P} + \text{Q})\, h}$$
$$l = x \frac{\text{P}(l + h)}{(\text{P} + \text{Q})\, h}$$
$$\therefore x = \frac{lh(\text{P} + \text{Q})}{\text{P}(l + h)} = \frac{\text{P} + \text{Q}}{\text{P}} \times \frac{hl}{h + l}.$$

General.

1. MAGISTER.—A vessel in the form of a cube, measuring 3 feet each way, is filled with water.

Find—(1) The pressure on its base in vacuo.

(2) The same in air. (*Blackie's* 'Mechanics.')

(1) Pressure in vacuo = $(3^3 \times 1000)$ oz.
$= \frac{27000}{16}$ lbs.
$= 1687\frac{1}{2}$ lbs.
$= \underline{1,687\frac{1}{2} \text{ lbs.}}$ Ans.

(2) Pressure in air = $(3^3 \times 144 \times 15)$ lbs. + 1,687½ lbs.
$= (19,440 + 1,687\frac{1}{2})$ lbs.
$= \underline{21,127\frac{1}{2} \text{ lbs.}}$ Ans.

2. A STUDENT—The following are the eight cases of Proposition 2, Book I. :—

1. The given line has two extremities, to each of which a line may be drawn from the given point. This gives 2 cases.

2. The equilateral triangle may be described on either side of this line. This gives 4 cases.

3. The side BD of the equilateral triangle ABD may be produced either way. This gives 8 cases.

Note.—When the given point lies either in the line or in the line produced, the distinction, which arises from joining the two ends of the line with the given point, no longer exists, and there are only 4 cases of the problem.

You have given the 4 cases of (1) and (2), and have omitted the 4 cases under (3). The 5th and 6th cases you give fall under (1) and (2), and are therefore not included in the 8 cases. (See Note.)

3. J. D. M.—Please repeat your query, giving full particulars as to C_1, C_2, &c., as we have not the Algebra to refer to.

The right hand expression is a Harmonical Progression.

4. SPES.—Three or four hours study is ample. You can do a good deal in that time, if you are not tired when you begin. You say you know a smattering of Latin. That may mean nearly all the accidence or almost nothing. A considerable acquaintance with Latin is required and you had better devote one hour a day to it, and if you are not master of the accidence you should learn that by repeating small portions of it many times over each day. It is one of the subjects that you can hardly teach yourself satisfactorily. If you get a competent teacher do as he wishes you. Meantime read Dr. Abbott's 'Via Latina.' You do not want a special list of all necessary books. You can find them mentioned over and over again in the Query Column of the back numbers of the PRACTICAL TEACHER. For the French and German you should by all means take Hughes's new 'French and German Journal.' It contains just what you want.

5. E. W.—We have not yet met with anybody who will say he quite understands the new regulations. We are strongly of opinion that the answer to your question is NO. The examination was not intended for other than students. We will keep your enquiry before us and reply to you again if we find that you can present yourself as you suggest.

6. WIDMORE.—Any good book on English composition contains a chapter on the Essay and often hints on writing them. If you can express yourself clearly, easily, and grammatically, what you want is rather to practice writing than to read about it. It would be easy to name books. Read the papers on the Essay in the PRACTICAL TEACHER. The main thing is practice and the study of the best models.

7. A PUPIL TEACHER.—Not in this column. Space is a consideration. You can, however, no doubt refer to back numbers and read the answers to examination questions. For the case you mention, write, say, four plain and neat sentences on each of the following heads.—It increases our own pleasure. It enables us to give pleasure to others. It greatly increases our power.

8. ANNULUS.—If you have the means of doing so consult Maxwell's paper on Saturn's Rings. Be more definite. Do you want an account suitable for Standard VII., or for the honours paper in a South Kensington Examination?

9. MAB.—We think not. But you would do well to write and ask the Secretary of the Tonic Sol-fa College the question. You might hear of the sort of thing you want.

10. IXION.—Yes. (1) Twisden's 'Mechanics.' Lock's 'Dynamics for beginners.' Todhunter's 'Mechanics for beginners.' For the advanced algebra you would do well to add C. Smith's or Hall and Knight's larger books to Todhunter's 'Manual.' By comparing the chapters on the same subjects you will get considerable help. Smith's 'Conic Sections' (Macmillan and Co.) is also an admirable book. For the Calculus, use Williamson's books (Longmans and Co.). They are excellent. For the sound, light, and heat (Elementary) you might choose several books. Try Longmans and Co.'s new book by M. R. Wright.

11. QUERIST.—The English subjects for males at the 2nd year certificate examination, 1888, are :—Shakespeare's Julius Cæsar, Milton's Comus, Macaulay's Essays on Milton and Addison. There will be questions on paraphrasing and on the style, language, and subject matter. Heller's Code is published by Messrs. Bemrose and Sons, Old Bailey.

12. W. H.—Do you see the Query Column regularly? If so you will often see books recommended. Make a note of what you are likely to want. The first thing for you to get is the syllabus. You can get that by writing to the Registrar, Burlington House, Piccadilly. You must then decide what subjects you will take and at what date you will sit. Until that is done, we do not know what subjects you will have to study. The books you require depend partly upon what you know already and partly upon what you want to prepare for.

13. SCOT.—Grammar, Smith's (Murray), 3s. 6d.; Arithmetic, B. Smith's (Macmillan), 4s. 6d.; Mensuration, Todhunter's (Macmillan). 2s. 6d.; History, Green's (Longmans), 6s.; Latin, Abbott's 'Via Latina' (Seeley and Co.), 3s. 6d.; Algebra, Todhunter's (Macmillan), 2s 6d.; Geography, Mackay's (W. Blackwood & Son); French, Progressive Course (Macmillan), 1s. and 1s. 6d.; Music, Dunstan's Manual (Hughes), 3s.

14. R. O. R.—There is a small text book by Remsen, 2s. 6d., that would suit you very well. Work at it as well as read it. For a grammar you could consult Fasnacht's (Macmillan) or a score others. Be sure to read Hughes's 'French and German Journal.' It contains exactly what you want.

15. H. G. GOLDSMITH.—Yes, the syllabus is quite clear. Unless you have passed satisfactorily in that group before Christmas, 1888, you must take arithmetic. Now you have not thus qualified, therefore you must take the arithmetic.

—o—

Pupil Teachers' Preparation Papers.

THE following is a test paper for the pupil teachers who are to be examined in April. It covers about one-third of the work of the year. On receipt of a postal order for one shilling, any single set of papers will be examined, valued, and returned post free, if sent to us not later than August 20th.

TEST PAPERS FOR PUPIL TEACHERS WHO ARE TO BE EXAMINED IN APRIL.

Directions.

1. Write on half sheets of foolscap, and on one side only.
2. At the top of each half sheet write your name in full, the full address of your school, and the year the papers of which you are taking.
3. Do not write the questions, but prefix to each answer the number of the question to which it corresponds.
4. Do not use any book or writing from which answers may be copied.
5. Keep strictly to the time allowed.
6. If you have not time to answer all the questions, choose those you can answer best; but do not omit the whole of any one subject.
7. If you wish them examined, corrected, and valued, send them to the office of the 'PRACTICAL TEACHER,' Pilgrim Street, Ludgate Hill, together with a shilling postal order, not later than the 20th August. They will be returned post free.

END OF FIRST YEAR.

(Three and a half hours allowed.)

Arithmetic.

(Do three sums only.)

MALES.

1. What is the difference between a *fraction* and a *fragment*? How would you show the difference to a class? Write down the names of the different kinds of vulgar fractions, with examples. (35)
2. Find the L. C. M of all the numbers from 1 to 12, and the G. C. M. of 575 and 915. Write down a rule for finding the G. C. M. of three numbers. (35)
3. What fraction of 3 cwt. 16 lb. is $\frac{5}{11}$ of 2 qrs. 7 lb.? (30)
4. Simplify $\frac{\frac{3}{5} \times \frac{5}{9} \div 1\frac{1}{8}}{\frac{1}{8} \times 6 \div 1\frac{7}{19}}$ (30)

FEMALES.

1. Practice is a short method for what rule? Work the following by both methods. 396 at 11s. 6½d. (35)
2. 3,523½ articles at £20 10s. 10½d. each. (35)
3. 3 lb. 4 oz. 7 dwt. of silver at £4 2s. 6d. per lb. (30)
4. Make out the following bill: 7 lb. at 2s. 3d. per lb., 16 lb. at 7d. per lb., 11 oz. at 1s. 7d. per oz., 9 lb. at 3½d. per lb, 7 lb. at 7¾d., 3½ lb. at 1s. 10d. per lb. (30)

Geography.

MALES AND FEMALES.

(Answer three questions only.)

1. Draw a full map of England and Wales, or your own county, or Scotland. Insert parallels, if you can. (40)
2. Describe the physical features of Wales. (20)
3. What are the chief manufacturing and the chief mining counties of England? Give the towns in each. (20)
4. Where and what are the following?—Skiddaw, Bala, Bangor, Leeds, Avon, Middlesex, Ulverston, Stonehenge, Hastings, Deal. (20)

Grammar.

MALES AND FEMALES.

(Answer three question only.)

1. Analyse the following lines:—

> Again I sit within the mansion,
> In the old familiar seat;
> And shade and sunshine chase each other
> O'er the carpet at my feet. (20)
>
> *Bayard Taylor.*

2. Parse the last two lines. (40)
3. Give definitions and examples of Abstract Nouns, Possessive Pronouns, Transitive Verbs, the Passive Voice, the Imperative Mood, Nouns in Apposition, the Nominative Absolute. (20)
4. Give the past tense and past participle of to *lie, stand, sit, fly, catch, bereave, cut, abide, thrive, smite.* (20)

Composition.

(Read the following story once only, and then write it from memory.)

Admiral Blake, when a captain, was sent with a small squadron to the West Indies on a secret expedition against the Spanish settlements. It happened in an engagement that one of the ships blew up. The crews were very much discouraged, but Blake, who was not to be subdued by one unsuccessful occurrence, called out to his men:—'Well, my lads, you have seen an English ship blown up; and now let's see what figure a Spanish one will make in the same situation.' This well-timed harangue raised their spirits immediately, and in less than an hour he set his antagonist on fire. 'There,' said he, 'I knew we should have our revenge soon!' (40)

History.

1. Name the kingdoms of the Heptarchy, and give the dates of their foundation. (25)
2. Write an account of Britain at the time of the Roman conquest. (25)
3. Name the Roman Emperors and generals who had anything to do with the conquest of Britain as fully as you can, and write a full account of one of them. (30)
4. What was the *Witan?* Who were called to it? What were *Romescot* and *Danegelt?* (25)

END OF SECOND YEAR.

FIRST PAPER.

(Three and a half hours allowed.)

Euclid.

MALES.

(Answer two questions, including question 3, if you can.)

1. To describe an equilateral triangle upon a given finite straight line. (20)
2. If two angles of a triangle are equal to one another the sides which subtend or are opposite to the equal angles, are also equal. (20)
3. A line which bisects the vertical angle of a triangle also bisects the base. Prove that the triangle is isosceles. (30)

Arithmetic.

FEMALES.

(*Answer the questions set for first year Males.*)

Grammar.

MALES AND FEMALES.

(*Answer questions* 1 *and* 2, *and one other question.*)

1. *How happy* is he *born* and taught
That serveth not *another's* will,
Whose armour is his honest *thought*,
And simple *truth* his utmost skill!

Whose passions not his masters *are*,
Whose soul is still prepared for death—
Not tied unto the worldly *care*
Of public fame *or* private *breath*.

Analyse the above passage. (20)

2. Parse the words in italics. (40)

3. Paraphrase the passage. (20)

4. What are *copulative verbs, defective verbs, reflexive pronouns, correlative conjunctions, gerunds?* Give examples. (20)

Geography.

(*Answer three questions only.*)

1. Draw an outline map of Europe, and insert the chief physical features; parallels and meridians required, if possible. (30)

2. Describe fully the Alps, or the Scandinavian range. (25)

3. Give a list of the rivers of Europe and describe minutely the course of the Rhine or the Rhone. (25)

4. What are the chief minerals of Europe; where are they found; and what are the chief mining centres of the different countries? (25)

SECOND PAPER.

(*Two hours and a half allowed.*)

Needlework for Females.

(*One hour allowed.*)

Arithmetic.

MALES.

(*Do three sums only.*)

1. If the carriage of 3 cwt. 3 qrs. 14 lbs. for 104½ miles cost £1 14s. 10d., what should be charged for the carriage of 5 tons a distance of 93 miles? (30)

2. A man spends 65 per cent. of his income, and has £434 remaining; what is his income? (30)

3. The population of a town was 5,600 in 1861, and 4,802 in 1871; what per cent. was the decrease? (30)

4. What is *ratio? proportion? interest?* What are the usual methods of working examples in proportion? State the merits of each. (40)

History.

MALES AND FEMALES.

(*Answer three questions only.*)

1. What were the respective claims of William the Conqueror and Harold to the throne of England? Give the chief events of the Conqueror's reign, with dates. (30)

2. Give an account of the struggle for the English crown after the death of Henry I. (25)

3. What were the chief features of the Norman rule in England? (25)

4. How could you show from the present condition of the laws and language, &c., of England that there had been a Norman conquest? (25)

Teaching.

(*Answer two questions only.*)

1. Correct the following piece of Dictation, putting in all needful stops, capitals, and other grammatical signs:—

A scythain prince named anacharsis came to athens to lern the wisdom of the greekes. he arived about the year b c 594 he betook himself to Solons house sent him word who he was and said i wish to live with you if i shall not cause you inconvenence solon replied seek for hospitality in your own country for he like the other greekes considered the Scythians barbarian's Anacharsis forthwith entered the philosophers apartment and said I am here in my own country justice demands that hospitality should unite us. (20)

2. Give six specimens of the various provincialisms which you have detected in your reading class, and say how you try to correct them. (20)

3. Write the word 'Multiplication' as a specimen of copy-setting on the blackboard. Say what directions you would give about the heights of various letters, and the method of forming and joining the letters. (20)

4. Write a dozen examples of questions in Second Standard Mental Arithmetic. (20)

END OF THIRD YEAR.

FIRST PAPER.

Three hours and a half allowed for this paper.

Euclid.

MALES.

(*Answer two questions, including question* 3, *if you can.*)

1. If a side of a triangle be produced the exterior angle is equal to the two interior and opposite angles, and the three interior angles of every triangle are together equal to two right angles. (30)

2. The straight lines which join the extremities of equal and parallel straight lines are themselves equal and parallel. (20)

3. ABCD is a parallelogram having the side AB greater than the side AC. The angle at C is bisected by the line CE, which meets the line DB produced to E. Show that three isosceles triangles are formed in the figure. (30)

Algebra.

MALES.

(*Answer two questions, including question* 1 *if you can.*)

1. Define the terms *product, quotient, co-efficient, indices, root,* and *factor,* and give examples of each.

If $a = 3$ and $b = 2$, find the value of

$$\frac{a^5 - b^5}{a^4 + a^3b + a^2b^2 + ab^3 + b^4}.$$ (30)

2. Show that the product of the sum and difference of two quantities is equal to the difference of their squares.

Add $(x + y)^2$, $(x - y)^2$, $(x + y)(x - y)$. (20)

3. Prove that $(x^2 + y^2 + z^2)(a^2 + b^2 + c^2) - (ax + by + cz)^2 = (bx - ay)^2 + (cy - bz)^2 + (az - cx)^2$. (20)

Mensuration.

MALES.

(*Answer one question only.*)

1. How do you find the area of a rectangle? Of a rhombus? Of any parallelogram? Find the area of a garden 30 ft. 6 in. long by 6½ yds. wide. (20)

2. How much paper, ⅝ yd. wide, would be required for the walls of a room 15 feet long, 13 feet broad, and 10½ feet high? (20)

Arithmetic.

FEMALES.

(*Answer three questions only.*)

1. Which is greatest and by how much:—·7 or ·76? What is the rule for converting recurring and non-recurring decimals to vulgar fractions? (40)

2. Add ·75 to ·075, substract ·075 from the sum, multiply the remainder by 7·5, and divide the product by ·0075. (30)

3. What is the value of ·325 of a cwt. in ozs.? (30)

4. I lost ·7 of my money, then I spent ¾ of the remainder; with ⅓ of what was then left I bought a book, and then found I had 5s. in my pocket. How much had I to commence with? (30)

Grammar.

MALES AND FEMALES.

(*Answer questions* 1 *and* 2, *and one other question.*)

Thy chains the unmeasured universe *surround*;
Upheld by Thee, by Thee *inspired* with breath!
Thou the *beginning* with the end *hast bound*,
And bountifully mingled life *and* death!
As sparks mount upward from the fiery blaze
So suns *are born*, so worlds spring *forth* from Thee!
And *as* the spangles in the sunny rays,
Shine round the silver snow, the pageantry
Of *heaven's* bright army glitters in Thy praise.
Denzhavin.

1. Paraphrase the above passage from an 'Ode to the Almighty.' (20)
2. Analyse the last five lines and parse the words in italics. (40)
3. Write ten Latin prefixes with their meanings with two examples of the use of each. (20)
4. Write a short lesson on Mood. (20)

Geography.

(*Answer three questions only.*)

1. Draw a map of Siberia *or* China, *or* Africa. (30)
2. Write full notes of the physical features of India. Illustrate by a rough sketch map. (25)
3. Name the rivers running into the Arctic Ocean from Asia and write a description of one of them. Give a sketch map. (25)
4. Which are the principal mineral districts of Asia? What articles do we export to Asia? (25)

SECOND PAPER.

(*Two hours and a half allowed.*)

Needlework for Females.

(*One hour.*)

Arithmetic.

MALES.

(*Answer three questions only.*)

1. Four reapers begin to cut a field of barley; after working for five days they have cut 10 acres; two additional men are then employed, who work at the same rate, and the whole is cut in three days more. How many acres does the field contain? (40)
2. Find the banker's discount on a bill for £731 0s. 6d., due 2½ years hence, at 5½ per cent. What will the banker gain? (30)
3. At what rate per cent. will the discount on £3,729 7s. 6d., due 4 years hence, be equal to the interest on £4,661 14s. 4½d. for the same time. (30)
4. A certain number of apples were bought at four a penny, and an equal number at three a penny. The whole were sold at seven for two pence; find the gain or loss per cent. (30)

History.

MALES AND FEMALES.

(*Answer three questions only.*)

1. Give a list of the battles of the Civil War, with dates, and a full account of one of them. (25)
2. Explain the title of James I. to the English throne. What were the chief events of his reign? Give dates. (30)
3. Who was Oliver Cromwell? Write a short account of the Protectorate. (25)
4. What attempts were made against the lives of the sovereigns of the Stuart period? Give dates. (25)

Teaching.

(*Answer two questions only.*)

1. Write full notes *for* a lesson on *Voice*, *Trade Winds*, or *Volcanoes*. If in infant school *Shades of Colour* for highest class. *A Tea Cup* for second class. State what apparatus, &c., you would use. (20)
2. How do you teach the different uses of words as parts of speech? Take the words *but* and *that* for the purpose of illustrating your answer. (20)
3. Write a dozen specimen questions you would use when revising a lesson on *Pronouns* (given to upper classes) or *Coal* (to infants). (20)

END OF FOURTH YEAR.

FIRST PAPER.

(*Three and a half hours allowed.*)

Euclid.

MALES.

(*Answer two questions, including Question* 3, *if you can.*)

1. Write out the definitions and the first proposition of the Second Book of Euclid. (30)
2. If a straight line be divided into two equal and also into two unequal parts, the rectangle contained by the two unequal parts, together with the square on the line between the points of section, is equal to the square on half the line. (20)
3. If a straight line be divided into two parts, prove that the squares on the two parts are least when the division is in the middle point of the line. (30)

Algebra.

(*Answer two questions.*)

1. What is an *equation*? an *identity*? Solve the equation

$$\tfrac{3}{5} \times \frac{x-1}{2x+1} = \tfrac{1}{2} \times \frac{x-3}{x+1} - \tfrac{1}{10}. \quad (20)$$

2. Reduce to their lowest terms

$$(1)\ \frac{x^2+x-12}{x^3-5x^2+7x-3}; \quad (2)\ \frac{x^4+a^2x^2+a^4}{x^4+ax^3-a^2x-a^3}. \quad (20)$$

3. If $a : b :: c : d$ show that

$$\frac{ma \pm nb}{ma} = \frac{mc \pm nd}{mc}. \quad (30)$$

Mensuration.

(*Answer one question.*)

1. Find the area of a circle whose circumference is 115½ yards. (20)
2. A regular pentagon has a side of 6¼ inches, find its area. (20)

Arithmetic.

FEMALES.

(*Answer three questions only.*)

1. Find the simple interest on £6,870 for 73 days at 3½ per cent. (30)
2. What sum invested at 2½ per cent. will amount to £7,680 in 3 years, at simple interest? (30)
3. In what time will the simple interest on any sum of money at 3¾ per cent. be ·09375 of the principal? (40)
4. If 3 per cent. more be gained by selling a horse for £83 5s. than by selling it for £81, what was the original price? (30)

Grammar.

MALES AND FEMALES.

(*Answer questions* 1 *and* 2, *and two other questions.*)

1. *So when* thou hast, *as* I
Commanded thee, *done blabbing*—
Although to give the lie
Deserves no less than stabbing—
Yet stab at thee who will
No stab the soul can kill.—*Raleigh.*

Analyse the above passage. (20)
2. Parse the words in italics. (20)
3. What are the main elements of the English language. State what parts of it are Saxon. (20)
4. Write notes for a lesson on *Voice*. (20)
5. Explain, as to a class, the above verse, pointing out the languages from which the words are derived. (20)

Geography.

(*Answer three questions only.*)

1. Draw a map of the Mediterranean Sea, *or* Canada, *or* Australia. (30)
2. What are the causes of the seasons? (20)
3. How would you explain to a class the fact that the people in Australia see the sun in the north and we do not, and that they have summer when we have winter. (20)
4. Name the planets and state their respective distances from the sun. (20)
5. Write an account of the physical features of S. America, *or* N. America. (20)

SECOND PAPER.

(Two hours and a half allowed.)

(Needlework for Females. *One hour.*)

Arithmetic.

MALES.

(Answer three questions only.)

1. If 15 men, 12 women, and 9 boys can complete a piece of work in 50 days, what time would it take 9 men, 15 women, and 18 boys to do four times as much, the parts done by each in the same time 3, 2, and 1? (35)
2. A detachment of cavalry consisted of 520 men after engaging in two battles; in the first it lost one man in every 25, and in the second $\frac{1}{8}$ of the remainder. Of how many men did the troop originally consist. (35)
3. Find the square root of 549081 and of $5\frac{4}{9}$. (30)
4. A man sold £19,200 Three per Cent. Stock at 85, and invested the proceeds in Four per Cent. Stock at 96. What was his income before and after the transaction? (30)

History.

MALES AND FEMALES.

(Answer three questions only.)

1. What were the chief provisions of Magna Charta. (25)
2. What was the Domesday Book? Who ordered its compilation? Why? (Answer fully.) (25)
3. State how the country was governed during the Heptarchy, the Roman occupation, and after 1066. (30)
4. Give with dates a list of the Plantagenet and Norman Kings. (25)

Teaching.

(Answer two questions only.)

1. Write notes of a lesson on one of the following:—
(a) The Steam Engine. (b) A Storm. (c) Snow. (20)
2. Write a list of object lessons suitable for the Second and Third Standards. (20)
3. How do you teach spelling? (20)

FOR TEACHERS IN INFANT SCHOOLS.

1. Write notes of a lesson on 'A Bear,' *or* 'An Oak tree,' *or* 'A Visit to the Seaside.' (20)
2. Give a few examples in paper-folding, and say what benefit children derive from such lessons. (20)
3. Name the varied occupations you use in your school, and say what faculties of the child are developed by each. (20)

—o—

Model Essays for Pupil Teachers.

BY C. J. DAWSON, B.A.,
Ex-President of the N.U.E.T.

VI.

IN previous papers of this series suggestions have been made of various means by which the students for whom they are written may acquire facility in the composition of short essays. In this paper a further suggestion is offered which, we have the best possible reason for knowing, may prove very serviceable if fairly put into practice. There are few persons preparing themselves for the work of teaching who have not frequent opportunities of hearing lectures and addresses on subjects which may interest them as teachers and be of practical use to them in their studies or in the discharge of their duties. Now the reporting of such lectures or addresses will afford excellent practice in composition.

To those who may have become expert in the useful art of writing shorthand, it will of course be possible to take down fully the very words of the lecturer. Then the exercise which would properly follow of transcribing the shorthand report into longhand would be in some measure an exercise in composition. This, however, is a rather laborious task, and is not, for our present purpose, so useful as another kind of reporting which we have chiefly in view, and which is available for such as may be quite ignorant of shorthand. We mean reporting from memory, which may be practised either with or without the aid of short notes taken during the lecture.

If the matter be reproduced entirely from memory its fullness will depend chiefly on the retentiveness of the memory, and that will depend largely on the closeness with which attention has been concentrated on the lecture. But as a result of experience it may be remarked that the conscious intention of reproducing what is heard conduces to closeness of attention, and further that the practice of such reproduction is a great help to strengthening the memory. Attention and memory are not, however, the only mental processes concerned in this practice of composition. It may well be that of themselves they are not the chief means by which students may gain the greatest advantage from hearing lectures.

It is not by mere mechanical absorption into the body that food becomes of real service to man, it is by the natural processes of chemical and physiological change that it becomes assimilated and converted into living energy of nerve and muscle. So it is with the mental food of useful information. It becomes of greatest use to us not by mere verbal appropriation by the memory, but by that complete assimilation which comes of letting the various mental forces work upon it in the processes of reflection and comparison. Hence we recommend the student who would get the most benefit from a lecture not to content himself with a bare report or summary of its contents, but to make free use of the information it conveys, to supplement that information by such other thoughts as it may suggest, and to so arrange the materials as to form a well-connected essay on the subject. Thus he may make the substance of the lecture thoroughly his own, and gain a decided step forward in the art of composition.

We propose to illustrate the foregoing remarks by a short essay, founded on the substance of an address recently delivered at a meeting of teachers on a subject of special interest and importance. The lecturer was Dr. Francis Warner, a medical man who has devoted his professional abilities to the cause of education, and the subject was one he has made his own.

THE OBSERVATION OF CHILDREN AT SCHOOL AS TO MENTAL FACULTY AND BRAIN CONDITION.

Educational systems can only be successful when they are properly adapted to the mental condition of those to whom they are applied. But the character of the mental faculties depends upon the condition of the brain, and the condition of the brain cannot be observed directly. It is a matter of inference, either from observation of the results of its action in learning lessons, or from other indications. Teachers especially under the prevailing system of education, are

liable to regard only those results which manifest themselves in examination, and for the great majority of healthy children such results may sufficiently indicate the character of brain and mind.

There are, however, in every school certain children, usually a small proportion, who differ considerably from the average in their mental power; and if we look only to the kind of work they do we may draw incorrect conclusions. It is of the highest importance to such children that the physical indications from which the condition of their brain and nervous system may be inferred should be carefully observed. Those children who have weak brains, who, in the working of the nervous system, differ greatly from the average, are more apt to get into trouble, are more liable to develop tendencies to evil.

Hence the subject is important not only to teachers, but to all who are responsible for the treatment of children, to parents, school-managers, school-inspectors, and those who legislate on education. Its special importance to teachers lies in the facts, first, that they are held so directly responsible for the results of instruction, and secondly, that they have peculiar opportunities for thorough and systematic observation of children.

Our knowledge on the general question of the condition of brain and nerve in children is not so full as it should be. This probably arises less from any want of readiness to observe, than from want of guidance as to what and how to observe. Now to be of real use, observations must be, not vague and general, but scientific and methodical; and further they must be definitely recorded. If teachers will devote some attention to this, a body of facts may be collected which may not only serve a useful purpose for the individual observers, but may also form a basis for larger generalisations for the public good.

Among the points to be observed the following may be mentioned; size, form, physiognomy. Notice whether a child is small or large for age, whether fat not only in face, but as to trunk and limbs. Notice also shape of head, and any deformity of body or limb.

Then look to the signs of active condition of brain. Physical signs will indicate whether it is fresh or tired, weak or over-excited. Remember that what is most important is the correct observation and the exact recording of facts; and do not be too ready to draw inferences. If, for example, a child is fidgetty and mischievous, notice carefully whether the restlessness continues if his position be changed, or if he be moved from his neighbours.

Young children are full of spontaneous movement. As we become older spontaneous movement becomes less and less, until almost all movement is a matter of effort. Fatigue is not shown by a child being motionless. Rather with fatigue spontaneous movements begin to increase. With regard to such movements the teacher should notice what parts of the body are most affected by them, and to what extent.

A teacher must not expect to be able to draw a correct conclusion at once from his observations, much less must he suppose that careful observation will lead directly to the discovery of proper modes of treatment or specific remedies for defects. He may, however, be sure that the more systematic his observations the more likely they are to lead to true inferences, and that correct diagnosis is a preliminary to proper scientific treatment.

Here are some physical signs of a state of nervous weakness in a child: restlessness in sleep, nightmare, grinding of teeth; too tall for weight, face too thin, or possibly arms too thin, head not held upright, shoulders not on same level, trunk slightly inclined to one side (best seen from back). The balance of the body is a very important matter to observe. It may be well noticed by asking the children to hold their hands straight out in front with palms downwards. While the healthy child will, as a rule, keep them horizontal in a line with the shoulder, with all the fingers in the same plane, the weak or nervous child will have the arms inclined, the wrists bent, the hands drooping, or the fingers awkwardly separated.

The face gives many indications of brain condition. A furrowed brow, knitting of the eyebrows, vertical furrows between the eyebrows, often indicate chronic headaches or nervous exhaustion. The middle part of the face shows early signs of weariness, as in the fulness of the lower eyelids. Want of movement in the mouth is also a mark of fatigue. The child who is fresh and healthy exhibits constant play of features. Restless eyes are thought to be indicative of inattention; but other features and parts of the body should be noticed, or the inference may be a wrong one.

These are a few only of the points which should be observed for the purpose set before us. If teachers generally would follow the suggestions given, valuable results would surely be attained. A word should be said before closing to warn the reader against supposing that when observations are made, and correct deductions drawn from them as to weakness of brain or nerves in certain children, that the only consequence should be to withdraw such children from instruction. This would be to increase and perpetuate the evil, and would probably occasion a moral deterioration most disastrous to the children so neglected, and also to society. The proper training of these children is therefore a momentous matter for the State. When careful observation has discovered which children deviate so far from the normal condition as to be unfit for the ordinary mode of training, then comes the serious question what plan must be adopted for their education, and with this problem the present essay does not attempt to deal.

(To be continued.)

Model Answers to Certificate Questions, Christmas, 1887.

Male Candidates.

SECOND YEAR.

Greek.

Male Candidates may answer questions in *two* Languages.

TWO *hours allowed for this Paper.*

SECTION I.

1. Translate into English:—

Ἐπειδὴ δὲ συνῆλθον, λέγει ὁ Κλέαρχος τάδε· Ἐγώ, ὦ Τισσαφέρνη, οἶδα μὲν ὑμῖν ὅρκους γεγενημένους καὶ δεξιὰς δεδομένας, μὴ ἀδικήσειν ἀλλήλους· φυλαττόμενον δὲ σέ τε ὁρῶ ὡς πολεμίους ἡμᾶς, καὶ ἡμεῖς ὁρῶντες ταῦτα ἀντιφυλαττόμεθα. Ἐπεὶ δὲ σκοπῶν οὐδὲν δύναμαι οὔτε σὲ αἰσθέσθαι πειρώμενον ἡμᾶς κακῶς ποιεῖν, ἐγώ τε σαφῶς οἶδα ὅτι ἡμεῖς γε οὐδ' ἐπινοοῦμεν τοιοῦτον οὐδέν, ἔδοξέ μοι εἰς λόγους σοι ἐλθεῖν ὅπως, εἰ δυναίμεθα, ἐξέλοιμεν ἀλλήλων τὴν ἀπιστίαν. Καὶ γὰρ

οἶδα ἤδη ἀνθρώπους τοὺς μὲν ἐκ διαβολῆς τοὺς δὲ καὶ ἐξ ὑποψίας, οἳ φοβηθέντες ἀλλήλους, φθάσαι βουλόμενοι πρὶν παθεῖν, ἐποίησαν ἀνήκεστα κακὰ τοὺς οὔτε μέλλοντας οὔτ' ἂν βουλομένους τοιοῦτον οὐδέν. Τὰς οὖν τοιαύτας ἀγνωμοσύνας νομίζων συνουσίαις μάλιστα ἂν παύεσθαι ἧκω καὶ διδάσκειν σε βούλομαι ὡς σὺ ἡμῖν οὐκ ὀρθῶς ἀπιστεῖς.

2. Parse αἴσθεσθαι, ἐξέλοιμεν, φθάσαι.

3. ἦ πολύ με δόξης ἐξέπαισαν ἐλπίδες,
ἣν πατρὸς ὑμῶν ἐκ λόγων ποτ' ἤλπισα.
σοὶ μὲν γὰρ Ἄργος ἔνεμ' ὁ κατθανὼν πατήρ,
Εὐρυσθέως δ' ἔμελλες οἰκήσειν δόμους,
τῆς καλλικάρπου κράτος ἔχων Πελασγίας,
σταλήν τε θηρὸς ἀμφέβαλλε σῷ κάρᾳ
λέοντος, ᾧπερ αὐτὸς ἐξωπλίζετο·
σὺ δ' ἦσθα Θηβῶν τῶν φιλαρμάτων ἄναξ,
ἔγκληρα πεδία ταμὰ γῆς κεκτημένος,
ὡς ἐξέπειθες τὸν κατασπείραντά σε·
ἐς δεξιὰν δὲ σὴν ἀλεξητήριον
ξύλον καθίει δαίδαλον, ψευδῆ δόσιν.
σοὶ δ' ἦν ἔπερσε τοῖς ἐκηβόλοις ποτὲ
τόξοισι δώσειν Οἰχαλίαν ὑπέσχετο.
τρεῖς δ' ὄντας ὑμᾶς τριπτύχοις τυραννίσι
πατὴρ ἐπύργου, μέγα φρονῶν εὐανδρίᾳ,
ἐγὼ δὲ νύμφας ἠροθινιαζόμην,
κἠδη συνάψουσ', ἐκ τ' Ἀθηναίων χθονὸς
Σπάρτης τε Θηβῶν θ' ὡς ἀνημμένοι κάλῳ
πρυμνησίοισι βίον ἔχοιτ' εὐδαίμονα.

4. Parse ἦσθα, κεκτημένος, καθίει, ἀνημμένος, κάλῳ.

(1) When they met, Clearchus said, 'I know, Tissaphernes, that we have exchanged oaths and given pledges that we will do no injury to each other; but I see that you are on your guard against us as against enemies, and we, seeing this, are, on our side, on our guard against you. But as on observation I cannot detect you in any attempt to harm us, and I am sure that for our part we have no such thought in our minds, I determined to seek an interview with you, that we might, if possible, remove our mutual distrust. For I have known cases before now, arising sometimes from false insinuation, sometimes from suspicion, in which men, standing in fear of each other, and wishing to strike the first blow instead of waiting to receive it, have done irremediable wrong to those who neither designed nor desired anything such as was suspected. Thinking then that misunderstandings of this kind may easiest be ended by free intercourse, I have come to you and desire to prove to you that your distrust of us is unfounded.'

(2)

αἴσθεσθαι.	2 aor., inf., depon. of *αἰσθάνομαι*.
ἐξέλοιμεν.	2 aor., opt., act., 1st plu. of *ἐξαιρέω*.
φθάσαι.	1 aor., inf., act. of *φθάνω*.

(3) Far have my hopes dashed me down from that expectation which once I dreamed should come to pass according to your father's words. On *you* your father was to bestow Argos when he died, and you were to dwell in the house of Eurystheus, holding sway over the fertile Pelasgian land; and on your head it was his will to set the lion's fell, the armour wherewith he was wont to arm himself. *You* were to be lord of Thebes, the city of chariots, possessing the plains, that were my marriage portion: such promise did you win from your sire; and in your hands he would fain place his weapon of fence, the club cunningly fashioned, a traitor gift.* To *you* he promised to give Oechalia, which he made boot of in the days of old with his far-ranging arrows. And so with threefold princedoms did your father exalt you his three sons in the pride of his manly strength. And my part was to choose for you your brides, seeking alliances from the Athenian land, from Sparta and Thebes, that, like ships well moored with stout cables, you might live a prosperous life.

(4)

ἦσθα.	2 sing., imperf., indic., *εἰμί* (be).
κεκτημένος.	Perf., part., depon., nom., sing., masc., *κτάομαι*.
καθίει.	3rd sing., imperf., indic., act., *καθίημι*.
ἀνημμένος.	Perf., part., pass., nom., sing., masc., *ἀνάπτω*.
κάλῳ.	Dat., pl. mas., *καλώς* (Attic form for *κάλος*, a cable).

SECTION II.

Translate into Greek:—

(*a*.) If Cyrus had not come, the Greeks would not have marched against the king.

(*b*.) As to the Tigris, ye know that it is impossible to cross it.

(*c*.) There was a city on the other side of the river, Cænæ by name, whence they brought bread and cheese.

(*d*.) It is right to destroy utterly those who forswear themselves.

(*e*.) So long as I live thou shalt never kill the children of Herakles.

(*f*.) Standing afar off he repels his foes with arrows.

(*g*.) The son is called by the same name as the father.

(*a*) *εἰ μὴ ἦλθεν ὁ Κῦρος, βασιλεῖ οὐκ ἂν ἐπεστράτευσαντο οἱ Ἕλληνες.*

(*b*) *τὸν δὲ Τίγρητα ποταμὸν ἴστε ὡς διαβῆναι ἀδύνατον.*

(*c*) *πέραν δὲ τοῦ ποταμοῦ πόλις ᾤκειτο ὄνομα Καιναί, ἐξ ἧς ἄρτους καὶ τυροὺς διήγον.*

(*d*) *ἔδικαιον γὰρ ἀπόλλυσθαι τοὺς ἐπιορκοῦντας.*

(*e*) *ἐμοῦ ζῶντος οὐ κτενεῖς ποτε τοὺς Ἡρακλείους παῖδας.*

(*f*) *ἐκὰς ἀφεστὼς πολεμίους ἀμύνεται τοξεύμασιν.*

(*g*) *ὁμώνυμος τῷ πατρὶ ὁ παῖς.*

SECTION III.

1. Give an abstract of the life and character of Clearchus, as sketched by Xenophon. Who were the Ephori whom he mentions? State what you know of Gorgias.

2. (*a*.) *Ἦν μὲν ἦλθομεν ὁδὸν ἀπιόντες παντελῶς ἂν ὑπὸ λιμοῦ ἀπολοίμεθα.* Comment on the case of *ὁδόν*, and the use of the optative.

(*b*.) *Ἴσως δέ που ἢ ἀπορεσάπτει τι ἢ ἀποτειχίζει ὡς ἄπορος εἶν ἡ ὁδός.* One editor reads *ᾖ* for *εἶη*; give reasons for supporting (1) the text; (2) the emendation.

(*c*.) *Ἀλλ' οὐκ ἐμοῦ γε δεσπόσεις χαίρων ποτε.* Translate and comment.

(*d*.) *οὐ γὰρ ἔσθ' ὅπου ἐσθλόν τι δράσας μάρυρ' ἂν λάβοις πάτραν.* Translate and comment.

* A gift promised but not completed.

3. Give the exact derivations of the following words:—dramatist, paralysis, apostle, practical, epigram, economy, poet.

4. Point out any peculiar uses of the imperfect tense occurring in the books set.

5. Distinguish between the uses of *ἐπί*, *παρά*, *πρός* and *περί*, with the genitive, dative, and accusative cases respectively.

1. *Clearchus'* chief characteristic was his restless energy and ambition, which found their best opportunity in war and made peace intolerable to him. At the end of the Peloponnesian war he persuaded the Spartan government to send him with a force to the Thracian Chersonese, to protect the Greek cities there from the Thracians. Being recalled, he refused obedience, and was sentenced to death in his absence. He then threw himself into the schemes of Cyrus, raised a force for him, and joined him on his march to Babylon. It was by his influence that the ten thousand Greeks were dissuaded from abandoning Cyrus when they discovered the real object of the prince. He commanded the right wing at Cunaxa, and was, after Cyrus's death, tacitly acknowledged by the Greeks as their commander. He fell into the trap laid for him by Tissaphernes, and with the other Greek generals was captured, sent to Artaxerxes, and beheaded. He was an able general; maintaining discipline by a severity which alienated the affection of his men, though his coolness and resourcefulness in moments of danger won their confidence and admiration.

The *Ephori* were five magistrates of Sparta, whose functions were originally judicial. They gradually, however, extended their authority, and at this time may be considered as the chiefs of the executive, the two kings being little more than commanders-in-chief of the army.

Gorgias, of Leontini in Sicily, a sophist, or professional lecturer on philosophy and literature. He was contemporary of Socrates, and has given his name to one of Plato's dialogues. Xenophon mentions that Proxenus was one of his pupils.

2. (*a*) *ἰέναι*, an extension of the cognate accusative, carrying on the meaning of the verb *ἤλθομεν*.
ἄν—*ἀπολοίμεθα*, the apodosis of an indistinct future condition, the protasis of which is contained in the participle, *ἀπιόντες*.
(*b*) (1) the reading *ᾖ* is in agreement with the usual rule, that in final clauses ('in order that'), the primary conjunctive is used if the verb of the principal clause be primary.
(2) The defence of the reading *εἴη*, which breaks the above rule, is 'that the speaker introduces the aim of another person, not as existing in his own mind, but in the mind of that person, so that the sentence partakes of the character of *oratio obliqua*.'
(*c*.) 'But never shalt thou lord it over me at thy will.' An idiomatic use of *χάιρων*, 'rejoicing,' *i.e.*, without suffering for or repenting of your act.
(*d*.) 'For thou wouldst find nowhere a country that would bear witness to any noble deed of thine.' Literally 'There is no place where thou wouldst get (thy) native land as a witness, having done any good deed.'
λάβοις ἄν is the apodosis of a conditional sentence whose protasis is not expressed, being readily supplied from the sense of the context 'if thou shouldst make the attempt.'

3. dramatist. Formed from stem *dramat-* with suffix *-ist*. Greek *δρᾶμα* from verb *δράω*, to do.
paralysis. Borrowed from the Greek, *παράλυσις*, a compound of *παρὰ*, preposition, and *λύσις* from stem *λυ-*, loose.
apostle. From the Greek *ἀπόστολος*, one who is sent: compounded of *ἀπὸ*, preposition, and noun stem *στολ-* related to verb stem *στελ-* of *στέλλω*.
practical. Formed with adjectival suffix *-al*, from stem *practic-*; Greek *πρακτικ-ὸς*, from verb stem *πρακ-* of *πρᾶσσω*.
epigram. From Greek *ἐπίγραμμα* compounded from *ἐπὶ*, preposition and *γράμμα* from *γράφω*.
economy. From Greek *οἰκονόμος* (the *ε* representing a more correct *ᾰ*); *οἶκος*, house, and *νέμω*, distribute, manage, direct.
poet. From Greek *ποιητὴς*, a maker, formed by suffix *-της* from *ποιέω*.

(4) The imperfect tense is often used of an action contemplated, but never completed. Very good instances are the imperfects in the second passage for translation in Sect. I., *ἔνεμε*, *ἀμφέβαλλε*, *καθίει*, etc., which all express the intention of Herakles in the bestowal of his property on his sons, an intention which was not to be carried out.

5. *ἐπί* with genitive, 'rest upon.'
ἐπί with dative, 'rest at' or 'on.'
ἐπί with accusative 'to' or 'against' (motion implied).
παρά with genitive 'motion from beside.'
παρά with dative 'rest by the side of.'
παρά with accusative 'motion to or by the side of.'
πρός with genitive 'motion from near.'
πρός with dative 'rest at or near.'
πρός with accusative 'motion to near.'

Male and Female Candidates.

FIRST YEAR.

Latin.

Male Candidates may answer questions in *two* Languages; *Female* Candidates in *one* only.

TWO *hours allowed for this Paper for Male Candidates*; THREE *hours for Female Candidates.*

SECTION I.

1. Translate into English:—

(*a*) Sophocles ad summam senectutem tragœdias fecit: quod propter studium quum rem negligere familiarem *videretur*, a filiis in judicium vocatus est, ut, quemadmodum nostro more

male rem gerentibus patribus bonis interdici solet, sic *illum* quasi desipientem a re familiari removerent judices. Tum senex dicitur eam fabulam, quam in manibus habebat et proxime scripserat, Œdipum Coloneum recitasse judicibus, quæsisseque, num illud carmen desipientis videretur?

(*b*) Cujus sermone ita tum cupide *fruebar*, quasi jam divinarem, id quod evenit, illo exstincto *fore* unde discerem neminem.

2. Parse fully the words printed in italics.

3. Say briefly what is the object of the dialogue *De Senectute*, and what is the general character of the argument.

4. Decline the present Indicative of *dixisset*, *potest*, *evenit*. What kind of verbs are *potest*, *inquit*, *fruebar*? What is the past Indicative of *divinarem*? Decline it.

(1) (*a*) Sophocles composed tragedies to extreme old age, but appearing to neglect in this occupation his private affairs, a suit was brought against him by his sons, to the end that, just as amongst us fathers who manage their affairs ill are interdicted from the control of their property, he too as being fallen into his dotage, might be removed by the court from the management of his private estate. Upon this the old man is said to have read aloud to the court the Oedipus Coloneus, which he held in his hands and had recently written, and to have asked whether they thought that poem the work of a dotard.

(*b*) In his conversation I at that time took an eager delight, just as though I had a presentiment of what proved to be the fact, that after his death I should have no one from whom I could learn.

(2) *videretur*—3rd pers., sing., imperf., subj. of *videor* (deponent).
illum—acc., sing., masc. of *ille* (demonstrative used as 3rd personal pronoun) object of *removerent*.
fruebar—1st pers., sing., imperf., ind. of *fruor* (deponent).
fore—fut. inf. of *sum*; in substantival clause, depending on *divinarem*.

(3) The purpose of 'The Treatise de Senectute' is to disprove the justice of the common complaints against old age, that it cripples a man's activity, numbs his capacity for enjoyment, and forces him to live with the fear of death constantly present to his mind. The treatise is intended rather to please by its literary grace than to convince by its logic. The answers to the accusations made against old age are, that granting the vigour of the body decays, that of the mind increases; that the pleasures the old lose their power of enjoying are chiefly the lower and animal pleasures; but to intellectual pleasure they are at least as susceptible as ever. As to the fear of death, there is no period of human life which is exempt from it; death *may* come soon to the young; it *must* come soon to the old—that is the difference. And after all is death an event so greatly to be feared?

(4) dico, dicis, dicit — possum, potes, potest
dicimus, dicitis, dicunt — possumus, potestis, possunt
evenio, evenis, evenit
evenimus, evenitis, eveniunt

Potest is an irregularly declined verb, a compound of *potis* (*pote*) and *est*.
Inquit is a defective verb.
Fruebar is a deponent verb.

SECTION II.

1. Translate into Latin:—
(*a*) For I know the (just) control and evenness of your mind.
(*b*) This is the custom in use among philosophers.
(*c*) He died the year before I was Censor.
(*d*) Sophocles composed tragedies to extreme old age.
(*e*) I discover four causes for the apparent misery of old age (translate—Why old age may seem wretched).
(*a*) Novi enim moderationem animi tui et aequitatem.
(*b*) Sic enim inter philosophos fieri solet.
(*c*) Anno ante me censorem mortuus est.
(*d*) Sophocles ad summam senectutem tragœdias scripsit.
(*e*) Reperio quattuor caussas, cur senectus misera videatur.

SECTION III.

1. Give the dative and accusative singular and plural of—*versus*, *liber*, *vita*, *senex*, *studium*, *vir*. What cases in Latin nouns have often the same endings?

2. *Uteretur*. What sort of verb is this? Give similar ones.

3. Give the Latin for two, the third, twelve, eighteen, twenty, the twentieth, a hundred, the hundredth, a thousand, the thousandth.

4. Give two verbs, with their meanings, compounded from *ferre*, *legere*, *audire*, *cedere*. Classify the conjugations of each of the above verbs.

5. How many classes of adjectives are there in Latin? Write out the singular of *bonus*, and the plural of *facilis*.

(1)

Versui	versum	versibus	versus
libero (child)	liberum	liberis	liberos
[9]libro (book)	librum	libris	libros
Liber-o-æ-o	liber-is	} (adj. free)	
liber-um-am-um	liber-os-as-a		
vitae	vitam	vitis	vitas
seni	senem	senibus	senes
studio	studium	studiis	studia
viro	virum	viris	viros

In the first declension: the gen. and dat. sing., dat. and abl. plural, have often the same endings.

In the second declension: the dative and abl. sing., dative and abl. plural.

In the third declension: the dative and abl. sing., nom. and accus. plural, dative and abl. plural.

In the fourth declension: the gen. sing., nom. and accus. plural, dative and abl. plural.

In the fifth declension: the gen. and dat. sing., gen. and dat. plural, nom. and accus. plural, dative and abl. plural.

In all declensions, nom. and voc. sing. and plural.

(2) Deponent. Fungor fruor utor vescor loquor miror adorior, etc.

(3) duo, tertius, duodecim, octodecim or duodeviginti, viginti, vicesimus, centum, centesimus, mille, millesimus.

(4) Confero, compare: aufero, take away.
colligo, collect: deligo, choose.
exaudio, overhear: obedio, obey.
discedo, depart: concedo, yield.
Legere and cedere are of the third conjugation, consonantal stems, so is ferre for fer-ere.
Audire is of the 4th conjugation, -I stems.

(5) Two. (1) Those of three terminations -*o* and -*a* stems.
(2) (*a*) Those of two terminations, consonantal or -i stems.
(*b*) Of the -i stems some have distinct masculine, fem., and neut. forms in the nom. sing., as acer, acris, acre.
(*c*) Others have no distinctive form for the neut. nom. sing., as *vorax*.

N.	bonus	bona	bonum	faciles	facilia
V.	bone	bona	bonum	faciles	facilia
A.	bonum	bonam	bonum	faciles	facilia
G.	boni	bonæ	boni	facilium	
D.	bono	bonæ	bono	facilibus	
AG.	bono	bona	bono		

(To be continued.)

Pupil Teacher Examination Papers.
(Scotland.)

28TH APRIL, 1888.

END OF FIRST YEAR.

FIRST PAPER.

(*Two hours and a half allowed for this Paper.*)

Dictation.

Write from dictation, in a neat hand, with correct spelling and punctuation, the passage read by the Inspector.

Penmanship.

Write in large hand, as a specimen of copy-setting, the word 'Acknowledgment.'

Write in small hand, as a specimen of copy-setting, the sentence 'Kind hearts are more than coronets.'

Arithmetic.

MALES.

1. From the sum of $\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{6}$, and $\frac{7}{8}$, take the difference between $\frac{3}{5}$ of $3\frac{1}{3}$ of $2\frac{1}{2}$ of $\frac{1}{14}$ and $\frac{5}{14}$.

(*a*) $(\frac{1}{2} + \frac{3}{4} + \frac{5}{6} + \frac{7}{8}) = \frac{18 + 27 + 30 + 28}{36} = \frac{103}{36}$

(*b*) $\frac{3}{5}$ of $3\frac{1}{3}$ of $2\frac{1}{2}$ of $\frac{1}{14} = \frac{3}{5} \times \frac{10}{3} \times \frac{5}{2} \times \frac{1}{14} = \frac{25}{14}$

(*c*) $\frac{103}{36} - (\frac{25}{14} - \frac{5}{36}) = \frac{103}{36} - \frac{45}{63} = 2\frac{1}{4}$. Ans.

2. A can do a piece of work in 5 days, B in 9, and C in 10; how long should they take to do it if they all work together?

A does $\frac{1}{5}$ or $\frac{14}{70}$ in 1 day.
B ,, $\frac{1}{9}$,, $\frac{10}{70}$,,
C ,, $\frac{1}{10}$,, $\frac{7}{70}$,,
A, B, and C do $\frac{31}{70}$,,

∴ They will do the whole in $\frac{70}{31}$ or $2\frac{18}{31}$ days. Ans.

3. The half of $\frac{3}{4}$ of a block of buildings was sold for £625·275; by-and-by, when the valuation of the whole property had fallen by £480, what should be paid for $\frac{7}{9}$ of it?

(*a*) $\frac{1}{2}$ of $\frac{3}{4}$ = $\frac{3}{8}$. ∴ value of the whole = £625·275 × $\frac{8}{3}$

" " = £2084·25

(*b*) $\frac{7}{9}$ or $\frac{7}{9}$ of (£2084·25 − £480 = $\frac{£1604·25 \times 7}{9}$

" = $\frac{£11229·75}{9}$

" = £1247·75

" = £1247 15s. Ans.

4. Take (by decimals) $\frac{3}{7}$ from the product of ·009 and 137·281.

137·281
·009
1·235529000000
$\frac{3}{7}$ = ·857142857142.....
·378386142857. Ans.

FEMALES.

1. Find, by Practice, the rent of 918½ acres of land at £24 17s. 2d. per acre.

	£	s.	d.				
	918	5	0	= price of 918 ac. at £1 each.			
			4				
	3673	0	0	=	"	£4	"
			6				
	22038	0	0	=	"	£24	"
10s. = ½ of £1	459	2	6	=	"	10s.	"
5s. = ½ of 10s.	229	11	3	=	"	5s.	"
2s. = ⅕ "	91	16	6	=	"	2s.	"
2d. = $\frac{1}{12}$ of 2s.	7	13	0½	=	"	2d.	"
	22826	3	3½	=	"	£24 17s. 2d. ea.	

2. Make out and receipt a bill for:—6 cheeses, each averaging 13½ lbs. at £98 per ton; 3 hams, each weighing 18½ lbs., at 9½d. per lb.; 2 firkins of butter, weighing 210 lbs., at £5 7s. 4d. per cwt.; 3,000 eggs at 10½d. per dozen.

Ayr, 28th April, 1888.

Mrs. Scott,

Bought of Mr. Millar.

	£	s.	d.
6 cheeses, each 13½ lbs., at £98 per ton	3	9	6½
3 hams, each 18½ lbs., at 9½d. per lb.	2	3	11¼
2 firkins butter (210 lbs.) at £5 7s. 4d. per cwt. ...	10	1	3
3,000 eggs at 10½d. per dozen	10	13	6½
	£26	8	3½

Pa'd 28/4/88
John Millar.

3. Take the sum of 2⅝, ⅞ and 3¾, from the difference between 3½ and 18$\frac{4}{7}$.

(18$\frac{4}{7}$ − 3½) − (2⅝ + ⅞ + 3¾) =
(18$\frac{56}{98}$ − 3$\frac{49}{98}$) − (2$\frac{35}{98}$ + $\frac{98}{98}$ + 3$\frac{84}{98}$) =
14$\frac{7}{98}$ − 7$\frac{17}{98}$ = 14$\frac{105}{98}$ − 7$\frac{17}{98}$
= 7$\frac{88}{98}$. Ans.

4. Find the G. C. M. of 408, 357, 612, and 544.

(*a*) 7|357|408|1 (*b*) 51|612|12 (*c*) 1|51|544|10
357|357 612 51|544
51 34|51
17|34|2
34

∴ 17 = G. C. M. Ans.

Grammar.

1. The following passage is to be analysed in detail:—

'They were *all knights* of fame and had seen service in *most* of the wars of their time, but had now met in their old age, *where* in their youth they had parted many *years before*.'

2. Parse the words in italics, and also the word 'both' in the following sentences:—

(*a*) 'They were *both* soldiers.'
(*b*) 'He was *both* a soldier and a sailor.'
(*c*) 'You cannot *both* read at once.'
(*d*) 'You cannot *both* read and eat at the same time.'

ANALYSIS.

SENTENCE	KIND	CONNECT.	SUBJECT	PREDICATE	OBJECT	EXTENSIONS
1. They were all knights of fame	Principal		they all	were knights of fame		
2. and (they) had seen service in most of the wars of their time	Principal	and	(they)	had seen	service	in most of the wars of their time (time)
3. but (they) had now met in their old age	Principal	but	(they)	had met		in their old age (time)
4. where in their youth they had parted many years before.	subord. adv. of 'place' to 3	where	they	had parted		in their youth (time) many years before (time) where (place).

PARSING.

All—indef. num. adj., predic. of 'they.'
most—adj. super. deg., mod. (wars) or used as a noun obj. gov. by 'in.'
knights—com. noun, mas., plur., nom. after 'were,' in appos. with 'they.'
where—subord. conj., introd. subord. adv. sent. of 'place' and mod. 'had met.'
years—com. noun, neut., plur., obj. of 'time.'
before—prep. gov. (time), used as adj. qual. 'years.'

Both.

(*a*) Adj. qual. 'they.'
(*b*) Conj., cor-rel. with 'and.'
(*c*) Indef. adj. pron., qual. 'you.'
(*d*) Conj., cor-rel. with 'and.'

3. How do you distinguish between a clause and a sentence, and between a clause and a phrase? Give several examples of each.

A 'sentence' is a combination of words forming a complete thought; as, they are wearied; he has written; she gave orders.

A 'clause' is a subordinate member of a sentence containing a finite verb; as, when he comes; after we knew; which was understood.

A 'phrase' is any combination of words which does not contain a finite verb expressed or understood; as, in coming; on returning; before going home.

4. What do you mean by 'analysing' a sentence? Can a *word* be analysed?

Analysis is the division of a sentence into its primary elements, as the separating of the grammatical subject with its adjuncts from the predicate verb with whatever is attached to it as object, complement, or adverbial adjunct.

A *word* may be analysed by showing the root if a primitive; or root, prefix or affix, if a derivative; or by separating its parts if a compound.

SECOND PAPER.

(*Two hours and a half allowed for this paper.*)

Geography.

1. Draw a map of Ireland, indicating the *chief* physical features.

2. Explain the terms river-basin and watershed. Describe the principal river-basins of Scotland with their watersheds.

A *river-basin* is the whole area which supplies the water to a river, and the *watershed* is the slope between the ridge of the basin and the river itself.

The eight most important basins of Scotland are those of the Tay, Tweed, and Solway, Forth, Dee, and Don, Spey, Clyde, Linnhe basin, and Moray basin.

Three of these lie north of the Grampians, viz., the Moray basin and the basin of the Dee and Don on the east side, and the Linnhe basin on the west; and their united areas comprise almost the whole of the district known as the Scottish Highlands. Just to the south of these lie the basins of the Tay and Forth on the east side and that of the Clyde on the west. These touch each other and are separated from the former three by the Grampian chain and from the Tweed and the Solway basins by the Lammermoor and Lowther ranges. The first is separated from the second by the Ochil Hills, and the second from the third by the Campsie Fells. The basins of the Tweed and Solway constitute the southern Highlands. They are separated from England by the Cheviot range and from each other by the Lowthers; while the Tweed basin is separated from the Forth by the Lammermoors, and the Solway basin from the Clyde by the Lowther range.

3. Where are the following places situated, and for what is each notable:—Hull, Dunfermline, Macclesfield, Balmoral, Huddersfield, Kilmarnock?

Hull, on the Humber, in Yorkshire, is the fourth commercial city in England; its annual exports exceed £12,000,000 sterling, being the great outlet for the manufactures of the West Riding.

Dunfermline, in Fife, near the Firth of Forth, is a place of great historical interest, and noted for its linen manufactures. Charles I. was born here, and Bruce was buried in its Abbey.

Macclesfield, in Cheshire, employs 10,000 hands in the silk-weaving.

Balmoral Castle, the Highland residence of the Queen, is in Aberdeen, on the river Dee.

Huddersfield, in Yorkshire, in the basin of the Aire, is a great seat of the woollen trade.

Kilmarnock, in the middle of Ayrshire, is the largest town in the County, and has numerous manufactures.

History.

(Answer *any two* of the following questions.)

1. Give an account of Cæsar's invasions of Britain.

Cæsar first invaded Britain in B.C. 55. He landed on the coast of Kent and caused the Britons to submit to him. He returned to Gaul in a short time and in the following year (B.C. 54) he again invaded Britain. He found the Britons united under Cassivellaunus. Cæsar, however defeated the Britons, stormed a fort at Verulam and compelled them to give hostages. He then left with his prisoners of war, who were sold for slaves.

2. Describe the policy and Government of King Canute.

Canute's policy was one of peace. He proved himself to be a wise and just ruler. He maintained the English laws and ruled by them impartially. The country was divided into four earldoms—Northumberland, Mercia, East Anglia, and Wessex, a prominent noble being appointed to rule each under the king. He forced a king of Scotland to submit to him and ruled with a firm hand, not only England, but Denmark, Norway, and part of Sweden.

3. What do we know of the religion of the ancient Britons? Whence is our knowledge derived?

The religion of the ancient Britons, called Druidism, was a gloomy, mysterious, and superstitious paganism with rites practised in dark groves of oak, with human sacrifices and doctrines left unwritten and communicated only to a few persons. The Druids venerated the oak and mistletoe and believed in several gods.

Our knowledge of the religion of the ancient Britons is derived from Cæsar's Commentaries.

4. Give a full account of King Alfred, his life and his work as soldier and as legislator.

Alfred was born at Wantage in 849 and was twenty-two years of age when he became king (871). He had then as hard a task before him as ever any king has had—to reconquer his country and to re-civilise his people. For seven years he fought the Danes with varying success, but in 878 he was driven to the marshes of Athelney. Here he bided his time for striking a decisive blow, meanwhile making several successful sallies against the invader. In the guise of a harper he is said to have gained a correct knowledge of the Danish numbers and plans, and falling upon his enemies at Ethandune he gained a complete victory. The treaty of Wedmore gave the Danes a large part of land to re-people, which district got the name of Danelagh. Turning his attention to the sea he organised a powerful fleet to repel invasions. From 878 till 891 his dominions were at peace and during these years he rebuilt towns, churches, and monasteries. Schools were founded and scholars were invited from abroad to instruct the students; traders and craftsmen from the Continent revived expiring commerce, and introduced new arts and manufactures. Himself a scholar, he encouraged the revival of learning by his own labours and example. To facilitate the administration of justice Alfred introduced or revived the division of the whole kingdom into counties, hundreds, and tithings; the laws of his predecessors were collected and remodelled. His great designs perished with him in 901.

Composition.

Write the substance of the passage read to you; or a short letter describing how you spent your last holiday.

Glasgow, 28th April, 1888.

Dear Sir,

My last holiday was spent in a most enjoyable manner, for it was spent in the place hallowed by association with the life of our national poet, Robert Burns.

Having purchased a return-ticket at St. Enoch's station I was whirled away through Renfrew and Ayrshire to Ayr, the county town which Burns has characterised as one—

'Wham ne'er a toun surpasses
For honest men and bonnie lasses.'

At the town were found a long array of conveyances of all sorts and sizes, whose drivers were quite ready to carry us to 'The Monument' for a shilling a head. Along with some other holiday-makers, I took a seat, and away we rattled past a number of villas nestling among gardens and trees, past the famous race-course, and along a well-kept country road till we reached the cottage—the auld clay biggin—where Burns was born. Entering our names in the visitors' book, which bears the autographs of some of the most famous men in the world, we made a thorough inspection of everything worth looking at, and then repaired to Alloway Kirk—the scene of the most vivid picture in 'Tam o'Shanter'—whence we directed our steps to 'The Monument,' from the summit of which we had a splendid view of sea and land. Alloway Bridge, which the witches dared not cross, had to be seen, and after half-a-day had been spent in this vicinity, we returned to ramble along the streets and esplanade of Ayr, and with a last fond look at the 'Auld' and the 'New Brigs' we left for Glasgow, with an ample fund for future talk or reflection.

I am, dear Sir,
Your obedient servant,
THOMAS A. HUME.

(*To be continued.*)

Publications Received.

Cassell and Co.—
Slöjd. By Emily Lord.
Cassell's Coloured Historical Wall Sheets—Queen Elizabeth at Tilbury Fort.

Houlston and Sons—
The Beautiful Valley Series of Sermons to Children. Nos. 3 and 4.

Jarrold and Sons—
The Young England School Series. Standards 1 to 7.

Johnston, W. and A. K.—
Pictorial Astronomical and Geographical Diagrams (with Handbook).
Orosian Geography. By J. McCubbin and Daniel T. Holmes.

Longmans and Co.—
Longmans' School Grammar. By David Salmon.

Macmillan and Co.—
Arithmetical Exercises, &c. By H. S. Hall, M.A., and S. R. Knight, B.A.
Die Karavane (Hauff). By Herman Hager, Ph.D.

Moffatt and Paige—
The Aldine Reciter. By A. H. Miles.

Murray, John—
A Readable English Dictionary. By David Milne, M.A.

Nutt, David—
A Stepping-stone to French Translation. By B. Probst.

Philip, G., and Son—
Philips' Handy-Volume Atlases: British America; Australasia.

Smith, Elder and Co.—
The Cornhill Magazine. July and August.

Whittaker and Co.—
Drawing and Designing. By C. G. Leland.

Williams and Norgate—
La Fontaine's Fables Choisies. By Leon Delbos.

—o—

Publications Reviewed.

Some Contributions to the Science of Education. By William H. Payne, A.M. London: Blackie and Son.

The work before us has the credit of being the most authoritative contribution to the science of education in America. It is the effort of an educationist of high repute who approaches his subject with the double qualification of philosophic training, combined with much practical experience in the art of teaching. The object of the author, according to his own statement, has been 'to encourage among teachers the habit of serious reflection upon some of the greater problems in education to the end that they may find a new delight in an occupation otherwise monotonous and uninspiring.' Mr. Payne treats with great reverence the educational theories of the past, and views with almost harsh suspicion the modern notions which have been promulgated by Rousseau, Spencer, and Bain. At the same time there is throughout the essays an approval of their doctrine; especially is this manifest when methods of teaching are justified by reference to the principles of mental science.

'I am in nowise disposed to break with the past, and to dream of an approaching revolution in educational theory and practice,' says Mr. Payne. 'A better future for the schools is doubtless fore-ordained, but this is to be a growth, slow and halting, like all other forms of growth, and a growth out of past conditions and products. Since the human mind has been studied by the acutest thinkers of all ages and countries, and since the wisest and the best of men have been working at the educational problem under all conceivable conditions, I find it impossible to believe that all this mighty effort must go for naught, and that educational science must be constructed *de novo*.'

The reader necessarily asks the names of these educational revolutionists who state 'basic principles each of which expresses the half of a truth, but with such distortion and exaggeration as to be a virtual untruth.' The author shall answer for himself:

'Ancient education was concerned almost exclusively with accumulated knowledge, that is, with knowledge which could be acquired through the interpretation of language. We may properly and conveniently call this secondhand knowledge. The extreme modern theory is that learning is a process of discovery or of re-discovery. To employ the conceit of Rousseau, the pupil shall not learn science but shall discover it. Throw aside books, take nothing for granted, assume that the world of knowledge is unexplored, and then rise to the comprehension of the universe by repeating the experiences of the race. This, in brief, is the latest theory of learning and teaching. Locke was unconsciously the author of it . . . . and Spencer has attempted, by specious sophistry, to establish it on a basis of philosophy.'

We must refer our readers to Mr. Herbert Spencer's little work on Education for an answer to this violent and, as we think, uncalled for attack. At the same time we ask them to consider the following statement of Mr. Payne: 'The most of the science that we learn we must learn as literature, and not experimentally, and it is questionable whether, for the ends of culture, secondhand knowledge (*i. e.* from books) is not better than first hand knowledge. For practical or professional uses physiology should, no doubt, be learned in the dissecting room and in the physiological laboratory; but for the purposes of general culture it should be learned from books.'

Now let any teacher of physiology ask himself what kind of physiological science can be learned from text books alone? Is it not the superficial smattering of undigested knowledge which, whilst it is held, ministers chiefly to the vanity of its possessor, and when it is partly forgotten leaves the mind struggling with scraps of disconnected facts which had better never been accumulated. And this form of acquisition is designated by Mr. Payne 'Culture,' the culture surely arising from half knowledge, superstition and mental indolence.

In the chapter on Lessons from the History of Education we gladly note a willingness on the part of the author to acknowledge the value of the modern theory of education. Taking for text Matthew Arnold's statement that 'the ideal of a general liberal training is to carry us to a knowledge of ourselves and the world,' he adds, 'the two factors in this conception are the world *without* and the world *within*, the one discoverable by observation, the other by reflection. The historical fact that I wish to call attention to is, that the current of opinion has flowed first towards one of these regions of knowledge and then, by a recoil movement, towards the other. We of to-day are either promoting the recoil towards realism or physical philosophy, or are borne along in the current in spite of our resistance. The indications of fact are not to be mistaken. Object teaching, sense training, the culture of the observing powers, manual training, are positive marks, while the warfare against the classics, the discredit thrown upon metaphysics and a relaxing of faith in ideals and in whatever cannot be weighed and measured are negative indications of the same fact. . . . . In the meantime the man of one idea will continue to lift up his voice. On the one side there will be prescribed an exclusive intellectual diet of Greek and Latin and mathematical roots, and on the other of bugs, butterflies, and botanical roots. But for ourselves and our children we will order a mixed diet. Our sons shall be able to read the Iliad and

to ANALYSE AIR, EARTH AND WATER, and our daughters to read Dante and to make bread and cook a beefsteak. Our educational creed shall embrace both the trained head and the trained hand.'

With this enunciation of educational system we heartily agree, at the same time we have difficulty in reconciling it with the principles of educational science hitherto set forth by Mr. Payne. The scope and methods of the education the parent desires for his children do not harmonize with the principles of the professor.

In the chapter on the Pestalozzian maxim 'Proceed from the known to the unknown,' the author starts by asserting 'that this well worn "principle" is a bit of educational cant that passes current to save the labour of thinking.' Again, in the wide application of this maxim to educational processes, it is termed 'nonsense and cant.' The author further states 'this maxim is often employed to justify the constructive or synthetic method of teaching geography, according to which the pupil proceeds from schoolyard to township, from township to county, from county to state, from state to nation, from nation to continent, from continent to hemisphere, and finally to the globe. But . . . . this specious method is false, is absolutelywithout scientific justification.' Now this is a specific charge, and the ground is familiar. Instead of attempting to combat the position ourselves we will adopt a more effective method of warfare. Prof. Payne shall answer himself. Among his concluding remarks on this chapter are the following: 'I do not believe this dogma (maxim) can be employed with any certainty, save in cases where language is the medium of instruction.' In a previous chapter, pp. 91 and 93, the Professor argues that geographical knowledge is almost entirely inaccessible by direct means, and is acquired almost exclusively through language. So that we are now to accept the conclusion that geographical knowledge is to be obtained in accordance with the maxim the use of which just before has been denounced as 'specious, false, and absolutely without justification.'

In concluding a brief preface Prof. Payne states that 'in bringing these essays together into a volume I have tried to cancel repetitions that almost invariably appear in such a series of detached papers; but after all my care some such repetitions of thought, expression and illustration remain to tax the indulgence of the reader.' There are repetitions, it is true, of statements long held by our foremost educationists of such an excellent nature that they cannot be too frequently repeated. At the same time there are serious contradictions some of which we have dared to indicate.

Practical Papers on Digesting Returns into Summaries. By George E. Skerry. London: Simpkin, Marshall and Co.

This is a selection of twenty-four examination tests in the work of digesting and tabulating statistical information, with hints for the guidance of students. The exercise is a valuable and necessary one to many besides Civil Servants, and the suggestions given in this little book are very useful. The papers have been actually set in the Civil Service examinations, and therefore afford excellent practice for would-be competitors.

Reynolds's Experimental Chemistry. Part IV. Organic. London: Longmans, Green and Co.

This completes the author's well known course of experimental chemistry, and provides the student with a practical, as well as theoretical, introduction to the great organic division of the science. Those who have used the former parts are already familiar with the method Professor Reynolds has successfully employed in the inorganic branch of the subject. In his own words, he has sought to help the student to acquire a sound knowledge of the facts and principles of the science without overburdening him by undue detail. The book consists of 21 chapters of about 18 pages each. Minute instructions are given for making 150 experiments, which are intended to introduce to the student's observation all that it is really essential he should know in a first course on the subject. We have no hesitation in saying that this small manual is a thoroughly sound and honest book. A student who worked through it, as its author instructs him to do, would gain a real insight of what organic chemistry is. The book could be read through in a week; but if the 150 experiments are carefully done, a student who spends four hours a week for a year at the subject will not have wasted his time. We have not compared the table of contents with the requirements of the various examination boards. Should the subjects demanded be found in this book, a student could hardly find a better guide; and in any case it will be excellent upon all the matters it takes up. We very strongly recommend Professor Reynolds's 'Experimental Chemistry' as a whole, and especially this last contribution.

Bell's Reading Books. The Life of Columbus. By Sarah Crompton.

The Talisman. By Sir Walter Scott. Abridged for use in Schools. London: George Bell and Sons.

These are the two latest issues of an excellent series of short books. Miss Crompton tells the deeply touching story of Columbus, his perseverance in difficulty, his noble moderation in the hour of success, his patience under misfortune, in simple language and pleasing style. Children cannot well look upon reading as a disagreeable task if their lessons are given from a book like this, which has as deep an interest as attaches to a romance of fiction. Some chapters are added on Alonzo de Ojeda, Vasco Nunez, and Pizarro, companions and followers of Columbus; but the story of the Conquest of America by the Spaniards is so full of cruel deeds and treachery, that it is hardly pleasant reading.

'The Talisman' is for children one of the most attractive of Sir Walter Scott's novels; and this edition will be welcomed in many schools. It is abridged only in order to bring it within the compass of a school reading book, and this does not involve other alteration of the text than the occasional insertion of a paragraph or two to connect portions of the tale.

Civil Service Arithmetic. By R. Johnston, F.R.G.S. London: Longmans and Co.

As this book has passed into its twentieth edition, the public at any rate have accepted it as useful; and we need therefore add very little about it.

In the preface to this new edition the author draws attention to his treatment of Circulating Decimals, as well as Simple Proportion, and one or two other subjects.

We are glad to see Proportion, both Simple and Compound, taught as such, but we should doubt the wisdom of ignoring the unitary method altogether.

Other scales than the denary are carefully explained. and the work is not only full of examples on each method explained, but is supplemented by some competitive examination papers set by the Civil Service Commissioners.

Longmans' New Reading Sheets. London: Longmans, Green and Co.

Every one who has seen the primer to Longmans' Readers will be aware of the care employed in their compilation and the scientific basis upon which the lessons are built. These sheets are eight in number and are a reproduction of the primer on linen printed on both sides, and suspended on rollers. They can be easily seen by the largest class. Each sheet after the first contains a lesson in word making, together with one or two words which are to be learnt by sight and sound, the pattern being given. These words made and given are then combined in a reading lesson, and as the words are supposed to have been properly learnt, phrasing is introduced from the beginning. The lessons are thoroughly well prepared, and the get-up of the sheets is all that can be desired.

White's Grammar School Texts: Virgil's Æneid XI. London: Longmans and Co.

Dr. White's library of Latin and Greek texts is growing apace. There is nothing new in the method of arrangement in this volume from any of its predecessors that we can see. The notes and information is all given under the different words in the vocabulary at the end of the book. Whether this is the best plan or not we will leave others to say; but there is no doubt that it has led the learned editor to an exhaustive study of the Latin language, which is very apparent in the later editions of his admirable dictionary. The etymology contained in the vocabulary is its most important feature, and we believe that quite young students are soon fascinated with this study.

We may give as a proof of how thoroughly this particular book is done, that its vocabulary covers double the space occupied by that to the first book of the Æneid, whereas the book itself is only some fifty lines longer.

(a) Infants' Drill.

(b) Infants' Needlework: Instructions for the Knitting Frames. By Mrs. Hibbert. London: J. Marshall and Co.

Mrs. Hibbert is a successful infant school teacher in Shrewsbury, and she has given the benefit of her long experience of teaching infants to others in a series of little handbooks, of which the two named form a part. The first manual consists of a letter-press description of a number of movements suitable for exercises for infants, whether in seats, desks, or on galleries. The movements are simple, yet very effective, and must be conducive to good order and discipline. The book is well worthy the attention of all infant teachers.

As one of a series of varied occupations Mrs. Hibbert has introduced knitting frames. Manual (b) gives instructions for their use, prices of various materials with the amount required, making the directions of great practical value.

Modern Gymnastic Exercises. By A. Alexander. London and Liverpool: George Philip and Son.

This book has been published for the use of those members of Physical Recreation Classes who cannot avail themselves of professional teaching. It consists of a series of movements with light dumb bells, bar-bells, and Indian clubs, set to simple music, together with a number of directions for exercises on the parallel and horizontal bars, the trapeze, swinging rings, and the vaulting horse. There is some danger of youths overtaxing themselves when turned into a gymnasium alone, but moderate exercise in such a place must always have a beneficial effect upon the physique, and we are quite sure that Mr. Alexander is a safe guide to follow. If his advice be followed no evil results will ensue. We can as cordially recommend the book under notice as we formerly recommended the book of exercises for schools, and it will be possible for many teachers to introduce some of these exercises into the ordinary movements in use every day.

Lives of Great and Good Women. London and Edinburgh: W. and R. Chambers.

Messrs. Chambers have conferred upon every one engaged in the education of girls a lasting favour by the publication of this highly interesting and attractive volume. With girls themselves it is sure to be a favourite. Twenty-six short, crisp, instructive and entertaining biographies of some of the best, bravest and most intelligent of the world's women are here brought together, and no girl can rise from their perusal without better aspirations and more lofty purposes than previously. It will be an attractive gift book during this and future years.

Poynter's Drawing for the Standards. Books 25—28. London: Blackie and Son.

The books Nos. 25—28 complete the series. They include freehand and geometrical requirements for Standard VII. Book 25 has eight examples of single objects or groups of objects to be used preparatory to studying light and shade from the actual model and cast. They are well adapted for the purpose. Clear directions for the special objects and general remarks on shading accompany the examples. Books 26—28 comprise the further plane geometry, and the plans and elevations of rectangular and circular solids which complete the elementary school course. The whole series is well worthy the attention of teachers, and a child who has thoroughly mastered it will have the elements of technical instruction at command to enable him to proceed to any branch of mechanical work with an intelligence not otherwise attainable.

Natural History Object Lessons. By G. Ricks. London: Wm. Isbister.

The value of a book of object lessons depends mainly upon the fulfilment of three conditions:—

(1) The careful selection of suitable and accurate information.

(2) The arrangement of the collected material in a logical series both as to the lessons as a whole, and the parts into which each lesson is divided.

(3) The amount of guidance afforded the teacher in his presentation of knowledge to his class in one or more of the following ways:—

(*a*) By apt illustration both in statement and picture.

(*b*) By frequent appeal to the associations of related matter by means of comparison and contrast.

(*c*) By the indication of modes of stimulating the scholars to mental activity, so that what is taught may not only be interwoven with matter already known, but may remain a permanent possession as valuable for further acquisition as for present enlightenment.

(*d*) By showing how to train and develop the habit of expecting and recognising the relationships which everywhere exist in the world of natural objects with which the pupil is in daily contact.

Mr. Ricks devotes one half of his book to the material out of which the object lessons are to be made. The chapters on plant structures are admirable; the illustrations are excellent, and the matter is selected with a teacher's skill and a scientist's knowledge. The remaining half of the work consists of *specimen* lessons. The arrangement of these in systematic courses for the various classes is left to the teacher. As a consequence we find the lesson on 'Paws and Claws,' followed by a lesson on the 'Cocoa-nut;' lesson iii. is on 'Cotton and Wool,' and lesson iv. on 'An Egg.' It would have increased the value of his work immensely if Mr. Ricks had arranged these lessons with more system. Young teachers need especial guidance in this systematic arrangement of their object teaching. The lessons embodying a comparison between allied structures will be very helpful and suggestive: the 'outlines' are at times mere skeletons, and will need very skilful dressing in order to make them attractive; see, *e.g.*, the outline lesson on 'An Egg,' p. 182. We cannot speak too highly of the model sketches for the black-board at the end of the book.

Brave Men of Old. By Robert Fisher, M.A. London and Manchester: Jno. Heywood.

This little volume consists of twelve simple narratives of the minor prophets of the Old Testament. It will help many persons who have not leisure to peruse larger works to understand more clearly the character and the writings of these 'brave men of old,' and to take a more intelligent interest in the books and the lessons they were meant to teach.

Little Favourites. Juvenile Poems Collected and arranged by Bella Gall, Teacher. London: Hamilton Adams and Co.

The title fairly describes this booklet. The short pieces it contains are mostly well-known and are from pens of well-known writers. We have Mary Howitt's 'Buttercups and Daisies' Campbell's 'Poor Dog Tray' and several of Ann and Jane Taylor's verses. We hardly understand whether the book is intended for use by children themselves, or for the teacher's use. If the latter, the simple explanations of words and phrases must be needless; and if the former, the book is not substantial enough. If it is meant for preparing for code requirements, as a prefatory note suggests, many of the poems are unsuitable, for they are distinctly religious. We do not know why some of the pieces have been curtailed, as Miss Ingelow's 'Seven Times One,' Mrs. Alexander's 'Little Birds,' and Mrs. Hemans' 'Better Land.'

Songs for School and Home Use. By Alfred S. Hill. Third Edition. Manchester: J. Heywood.

A useful collection of simple melodies, with appropriate words, suitable for all classes of schools.

Silkworms ('Young Collector' Series). By E. A. Butler, B.A., B.Sc. London: Swan Sonnenschein and Co.

In this nicely got up little volume Mr. Butler has presented us with a pleasantly written and most instructive account of Silkworms of all kinds, comprising a brief outline of their history from the time of their first domestication in the remote ages of antiquity until the present day, a sketch of their development from the egg to the perfect insect, a description of their internal and external anatomy, and a few practical suggestions with regard to their management. The book is a thoroughly good one. Mr. Butler has carefully avoided two of the great temptations which beset the zoological writer: the one, to be unduly scientific, and to adopt language 'not understanded of the people;' the other, to be interesting and amusing at the expense of accuracy. And yet he has contrived to pack a wonderful amount of sound information into a small compass, and to treat his subject with an exhaustiveness leaving little or nothing to be desired. A word of special praise is due to the singularly happy manner in which he has described the anatomical peculiarities of silkworms in the various stages of their development. The illustrations are not numerous, but are without exception well executed and accurate; and, both to silkworm breeders and to all others interested in entomological subjects, the book is one which we can most thoroughly recommend.

British Birds, their Nests and Eggs. By W. Harcourt Bath. London: Swan Sonnenschein and Co.

A little volume belonging to the same series as the preceding; but unfortunately we cannot speak of it in terms of similar praise. Mr. Bath has not the knack of imparting information in the attractive manner so essential to all who write upon natural history subjects for the benefit of general readers. He mentions a few disconnected facts with regard to a bird, perhaps gives a superficial description of its plumage or its eggs, and then passes on to the next; and more than this is required by the readers for whom the book is intended. Nor is Mr. Bath either consistent, or in all cases accurate. He makes no mention, for example, of the slight but constant distinctions which separate the marsh tit from the cole tit, although many birds which not even the merest novice could fail to recognise are somewhat minutely described. The bullfinch, we are told, is 'nowhere found in abundance'; many farmers and gardeners could tell a different tale. The curlew is described as a rarity, and the woodcock as a greater rarity still. The nest of the long-tailed tit is stated as 'generally fixed in the fork of some tree,' whereas it is more commonly situated in a low, thick bush; the bird itself is described as congregating during winter in large flocks, whereas the members of each family only live together; and, most curious blunder of all, the redbreast is given as 'one of our greatest benefactors.' Certainly the bird is not in any way mischievous, but why it should thus be glorified above the starling, the rook, the nightjar, the kestrel, and the owls—whose beneficial work is completely ignored—passes our comprehension altogether. The most valuable portion of the book is undoubtedly the short appendix, on the collection and preservation of birds, by Mr. R. Bowdler Sharpe, which, as is only to be expected from the pen of so high an authority, is all that can be desired. Full instructions are given for skinning, mounting, and arranging specimens for the collection, and—we are delighted to see—the practice of indiscriminate slaughter, even for such a purpose, is reprehended in the strongest terms. Even this portion of the book, however, is disfigured by six of the very worst illustrations which it has ever been our lot to see, and we can only regret that matter so excellent as Mr. Sharpe's letterpress should not have appeared under more favourable conditions.

A Manual of the Type-Writer. By John Harrison. London: Isaac Pitman and Sons.

This little book describes the form and working of one of the most marvellous instruments of the day—the Remington Typewriter. There are of course other mechanical writers in existence besides the Remington, but the various types of this instrument seem by their general excellence and by their extensive adoption in all parts of the business world to be *facile principes*, and almost to merit the mode in which they are alluded to in the title of the manual now under review as '*the* Type-Writer.'

Ever since writing began there has been a race between the pen and the tongue; and the pen has proved thus far the laggard. Shorthand has of course done wonders on the pen's behalf, but even the swiftest shorthand-writer is beaten by a rapid talker in anything like a sustained effort. To the general public too the phonetic symbolism of shorthand is as a sealed book. Not so the symbols registered by the type-writer. Clearness and legibility are their main features; and all persons—and they are legion—who have been hampered and delayed by the villanous hand-writing of their correspondents will welcome the time when mechanical type-writing becomes universal: at any rate in business communications. In speed the type-writer cannot of course compete with shorthand, but a speed of 40 words per minute is by no means uncommon and for sharp bursts a speed even of twice that is not unknown. What this means may be more fully appreciated when one considers that the ordinary rate of writing in a fairly legible style is about fifteen words per minute, if due attention is paid to dotting the *i's* and crossing the *t's*. In addition to legibility therefore, speed is a merit possessed by the type-writer. In America stenography and the use of the mechanical writer go hand in hand: the letters are taken down in the one, and transcribed by the other: and as far as the present writer's experience goes, nearly half of the business communications sent to this country by high class American firms is type-written. The holder of the combined offices of 'stenographer' and 'machine operator' seems to enjoy quite a professional status and to command very fair remuneration; as indeed they ought to when their qualifications in the way of finger-deftness and thought-celerity are considered. The type-writer seems to be especially adapted for ladies' use, and we are very glad to see that in this country it has already initiated a well defined calling for educated women. The only drawback to the extended use of the Remington type-writer is its price, which, as it at present stands, is we fear almost prohibitive of its general adoption.

Mr. Harrison's little manual draws attention to an instrument whose capabilities cannot be too widely known.

Elementary Introduction to Chemical Theory. H. Macan, M.A. (Oxon.), F.C.S. Manchester: John Heywood.

This is a small volume of 40 pages, containing short statements of facts and principles which have to be gone over and over until they become, in some way or other, part of the pupil's mental possessions. The book may be useful. It certainly might be more so. The statements are a little too dogmatic, too unqualified. Surely the atomic theory should have been mentioned, and its author. There is no difficulty in stating what that celebrated theory was invented for, and how it accomplishes the task. Why should a boy learn that 'an atom never remains in any substance without being joined to some other atom'? The boy is told that the relative weights of the molecules can be determined in virtue of Avogadro's law. He then reads that chemical analysis will tell the relative proportions of the elements in the molecule, so we find at once the relative weight of the elements of the weight of the atoms of the substances. Would this be clear to the boy's mind? Would it not be better he should learn a statement like this by heart? What the boy wants to know is how many atoms there are in the molecules whose relative weights are under consideration. Analysis gives the percentage composition by weight or by volume, and that is all. We have enlarged upon this, perhaps unduly, because of the tendency to give boys a sort of rough outline which can be corrected afterwards. We think this method is wrong. It is inevitable that there must be much to add; there ought to be nothing to unlearn.

The 'Practical' Mental Arithmetic. By an Inspector of Schools. London: Longmans, Green and Co.

The 'Inspector of Schools' complains, and perhaps not without reason, that Mental Arithmetic seems to be the least successfully taught subject in Elementary Schools. The causes of this failure he attributes to 'want of system' and 'habitual neglect.' He then gives some general hints to teachers as to the aims and methods of lessons in this important part of education. The 'want of system' he has shown how to remedy by building up a very long and capital series of examples of questions based upon a definite plan, carrying it on through the whole of the standards.

The greatest need for quantity and variety as every practical teacher knows is in the lower standards, which often are left to the care of junior and inexperienced teachers. How these standards are cared for may be seen from the fact of there being upwards of a thousand questions for Standards I. and II. Every teacher would be amply repaid in the success of the school if he would purchase the book and go through the examples with his pupil teachers and junior assistants during the time appointed for lessons for the former. The little book thoroughly deserves the adjective 'Practical' included in the title.

Kinder und Hausmärchen gesammelt durch die Brüder Grimm. With Notes and Vocabularies, by G. Eugène Fasnacht. London: Macmillan and Co.

In the title the author has omitted to mention the most valuable feature in the book—Imitative Exercises. For ourselves, we hope detached sentences will be banished from every school. Does any boy ever remember these 'disjecta membra' except with a shudder? Boys take great interest in imitating what they have read, and they must study the text carefully and thoroughly, otherwise they cannot do the imitative exercises. These exercises bring out (educate) every good linguistic quality the pupil possesses. The tales are very interesting, the notes very full and explanatory, and there is also a useful alphabetical vocabulary. We cordially recommend the book to all who wish to make rapid and solid progress in German.

The Mermaids: A Cantata for Female Voices. By John Kinross. London: J. Curwen and Sons.

The cantata before us is a work of such exceptional merit that it demands more than a passing notice. Mr. Kinross has before received honourable mention in these pages in connection with the musical illustrations for Mrs. Curwen's admirable little work 'The Child Pianist;' we therefore turned to the present composition with pleasurable anticipations which have been, on the whole, fully realized. The cantata throughout shows the hand of the musician—scholarly, graceful, imaginative, refined. At places it is a little difficult, but the difficulties are of a kind that repay practice.

The accompaniments, too, are *real* accompaniments, not mere doublings of the voice parts; and they are added with much skill, judgment, and effect.

Altogether, 'The Mermaids' is decidedly one of the best cantatas for female voices we have ever seen.

Criticising the music from the high standpoint it naturally challenges, we observe a lack of 'breadth,' especially in the rhythm; with the exception of one short chorus and a recitative, the movements are all either in triple or compound measures—'linked sweetness long drawn out.'

We think, also, that the long intermezzo, No. 6, might be considerably shortened, with advantage to the work.

Oxford, Cambridge and College of Preceptors Examination Papers. By Rev. Geo. Litting, M.A., LL.B., and George Home. London: Educational Supply Association, Ld., Holborn Viaduct.

One of the chief results of this age of competitive examinations is the preparation of examination tests and questions. Instead of education only being considered, all the teacher's aim is perforce to keep some examination in view and the end of his efforts is the success of his pupils in these tests. Mental disciplin counts for little in the efforts he puts forth. Until there is a radical change in our system we suppose this will continue to be the case, and if the end justifies the means then the preparation of these examination papers is thoroughly justified. The title of the volume before us sufficiently describes the nature of the work. It contains fourteen sets of progressive tests, increasing in extent and difficulty, in twelve different subjects, embracing all the essential and some of the special subjects of the three examinations named. The questions are practical and may be used as tests of general progress if necessary, without special reference to the particular object for which they were designed.

Seeley's Cheap School Books. Arithmetical Exercises. By F. C. Horton, B.A. London: Seeley and Co.

This is a collection of one hundred short papers of miscellaneous examples in arithmetic. Each paper contains six questions, which have been selected from examinations of various grades from those given in elementary schools by Her Majesty's Inspectors to those given at the universities, and to candidates for the civil service, the army and the navy. There is some graduation in the exercises, as the earlier ones are confined to elementary rules, and additional difficulties are introduced at successive points in the book. The questions may be used with any text-book and will doubtless prove useful for testing the progress of pupils.

Junior Church Catechism. By M. T. Yates. London and Manchester: John Heywood.

This pamphlet intended for young children contains a reprint of the Church Catechism without notes, a list of the difficult words with meanings, and a second reprint of the Catechism and notes to the same in parallel columns. The teaching in some of the notes is not in accordance with the belief of large numbers of members of the Church of England.

Handbell Ringing. By C. W. Fletcher. London: J. Curwen and Sons.

Mr. Fletcher, of the Royal Criterion Handbell Ringers, has produced an admirably clear and explicit work on the mysterious subject of which he treats.

The special notation required, the arrangements of the bells for particular keys, and the adaptation of the staff or sol-fa notations for hand-bell purposes are explained in a thoroughly practical and interesting manner, and the minutest details are dealt with, without unduly prolonging the volume.

We cordially recommend all our readers who feel interested in this popular and fascinating subject to procure a copy of Mr. Fletcher's book.

A few of the staff notation examples show traces of haste in the printing, as several blunders have escaped attention (particularly on pp. 41—43).

These do not, however, materially detract from the value of the book.

Sight-Singing and the Theory of Music. Revised and Enlarged Edition. London: National Society's Depository.

This useful and carefully prepared little work reappears with several improvements. It is arranged to meet the requirements of the New Code and the 'Moveable Do' system is adopted. It seems to us that it would have been much better to use the Sol-Fa syllables as arranged by Mr. Curwen: the names *do, ra, me, fa, so, la, te, do*^{1}, are in reality a compromise between the 'Fixed Do' and the Sol-Fa names. Thus, the second note of the scale, called by Sol-Faists 'ray,' and by Staff Notationists, generally, 're' (pronounced *ray*) appears in the present work as *ra*. To a Sol-Faist, *ra* is the 'flat of ray'; and as most teachers now get at least a smattering of Tonic Sol-Fa, the names adopted in the book before us would certainly be confusing and perhaps misleading.

A Merry Party. A Kindersingspiel. By A. L. Cowley. London: J. Curwen and Sons.

Mr. Cowley's long experience in connection with school music has been turned to practical account in this little work—a most interesting and effective cantata. Striking effects are constantly produced by the most simple means, and, both in matter and arrangement, the work stands far above the average school-cantata. The excellent round which forms No. 16 is a most happy effort, and testifies to the musicianly skill which Mr. Cowley has brought to bear on his work. Altogether, we consider 'A Merry Party' to be a very valuable contribution to the *repertoire* of school music.

The Musical Profession. By Henry Fisher, Mus. Doc. London: J. Curwen and Sons.

Dr. Fisher has given us a very interesting, instructive and readable book, treating most exhaustively on all the important questions relating to the Musical Profession. Preparation, Examination, Actual Work, Difficulties, Methods, Legal Matters, and a hundred other points of more or less importance come within the scope of the work, and Dr. Fisher has thrown light upon them all. We think there are only two things which will interfere with the success of the publication, its *bulk*, and its *price*. Could Dr. Fisher see his way to the issue of an Abridged Tabulated Edition, or Synopsis of his book, to be sold say at a shilling, he would confer a boon upon all young musicians who contemplate entering the profession.

The Armada: School Cantata. Compiled by A. J. Foxwell. London: J. Curwen and Sons.

Though not wanting in effectiveness and interest we cannot give unqualified praise to this compilation. With some few exceptions the music is decidedly commonplace, and such words as those of No. 4, 'What a bother 'tis with women, &c.,' are hardly appropriate or becoming on the lips of young children.

The Fairy Grotto. By E. W. Stratton. London: J. Curwen and Sons.

This Operetta is so bright and tuneful, and the general effect of it so pleasing, that it seems to us a pity that the harmonies are not more correctly written. In fact the whole composition is so good that it is quite evident that Mr. Stratton could make it much better if he wrote more carefully. There is a general looseness and exaggerated freedom in the progression of the parts which will prevent the acceptance of the work among musicians, who would otherwise admire the unmistakeable ability of the composer.

The Eton Latin Grammar, for use in the higher forms. By F. H. Rawlins, M.A., and W. R. Inge, M.A.

The Eton Horace: Part I. Odes and Epodes (Text and Notes). By F. W. Cornish, M.A. London: John Murray.

Whatever adverse criticism may be made upon these two books will certainly not extend to the form in which they have been published, which is in every respect admirable. Nor is this praise by any means entirely to be appropriated by the publisher. In both instances, and, from the nature of the case, especially in the Grammar, the task of the student has been lightened in every possible way by the judicious variations of type, each applied, so to say, with a definite pictorial purpose, so as to make the eye help the understanding of the learner to the farthest possible limit. Take an instance at random from page 147 of the Grammar, on which the formation of the present stem in the 3rd conjugation is discussed. One of the examples given is *nanciscor*: the word is printed na-n-c-*i*-scor. The letter n is in leaded type, showing that in it the reader is to look for the example of the rule in question, the nasalisation of the verb stem nac; whilst the italicised *i* reminds him that it does not belong to the stem, but is merely a link-vowel between the stem and the suffix -sc. Helps like this in a school-book are of a value and importance which will be appreciated by all teachers. The philological part of the accidence is, we are glad to see, very thoroughly done and clearly arranged; the fourth chapter, on the laws of sound-change, is a good case in point. The chapter occupies less than seven pages; it would be interesting to know how many boys go up from school with classical scholarships to Oxford or Cambridge owning any clear knowledge of the rules contained therein, which lie at the very foundation of the philological structure of the Latin language.

Any exposition of the syntactical construction of a language is always more open to difference of opinion than the accidence. Where, for instance, two uses of a case, such as the instrumental and modal ablatives, closely approach each other, it is hardly possible to draw a distinction which will satisfy everybody. Nor does the Eton Grammar settle the question; it would be hard for the teacher to decline to accept the explanation of *injuria suspectum* as an ablative of manner, and insist on classifying it as an ablative of attendant circumstances, minus the usual qualifying adjective or genitive. Mr. Roby's rule seems better, that the ablative of manner is ordinarily so qualified, except where it approaches most closely to the instrumental ablative, and in certain old phrases. So too the rules for the use of the third personal reflexive pronoun are hardly satisfactory. If the learner is taught that 'in a dependent clause, when the Subject is not the same as the Subject of the sentence, *se* and *suus* refer regularly to the Subject of the sentence, and not to that of the dependent clause,' is he not bound to believe that such a sentence as *Cæsar militibus imperat, ut se reciperent*, is false Latin?

The Eton Horace labours under the disadvantage of being written for boys who ought not to be reading Horace at all. If a boy is so young, or so backward, as to need notes like that on Ode xxxi., 17, in the first book,

in which the words are re-arranged in the *English* order, as well as interspersed with explanation and translation, is it likely that, unable by himself to make out the sense of a single sentence, he will at all realise or appreciate the connection of thought or the general drift of the whole Ode? The notes do not lay much claim to originality, being taken, as the prefatory note states, principally from Orelli. If their object is simply to enable the average boy of the middle and lower forms of a public school to produce a fairly correct translation of his lesson, they may be said to satisfy the requirements; it can hardly be hoped that the analysis of the matter which precedes the notes on each Ode will accomplish the hopeless task of instilling into such a boy any sense of the delicate allusiveness, the subtle transitions of thought, the graces of expression in which lies the whole charm of Horace's Odes, and of lyric poetry generally.

Geographical Reader: No 6, Holborn Series. London: Educational Supply Association, Lim.

This is a thoroughly interesting reader, neither too difficult in the phraseology nor too full of useless names. A successful attempt has been made to make the chapters word-pictures of the countries and the peoples of which they treat. The notes, maps, and facts in the appendix are all that could be desired, while the type, paper, binding, and illustrations are among the best of their kind.

The Training College Music Course. By Edward Mills, Mus. Bach., Oxon. London: J. Curwen and Sons.

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The Leipzig Album. A Collection of two-part songs for use in Colleges and Schools. Parts I. and II. London; J. Curwen and Sons.

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The Musical Inspection: how to prepare for it. By a School Music Instructor. London: J. Curwen and Sons.

This is a very useful and well written hand-book and should be in the Library of every school teacher. Though specially compiled for use in connection with the Sol-Fa Notation, the hints on the art and methods of teaching will be found valuable and interesting to those who prefer the Staff.

The Scholar's Geography. By J. S. Horn. London and Manchester: John Heywood.

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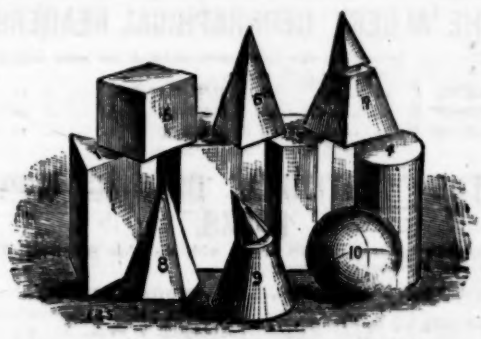

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